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DEVOTED TO TEXTILE WET-PROCESSING

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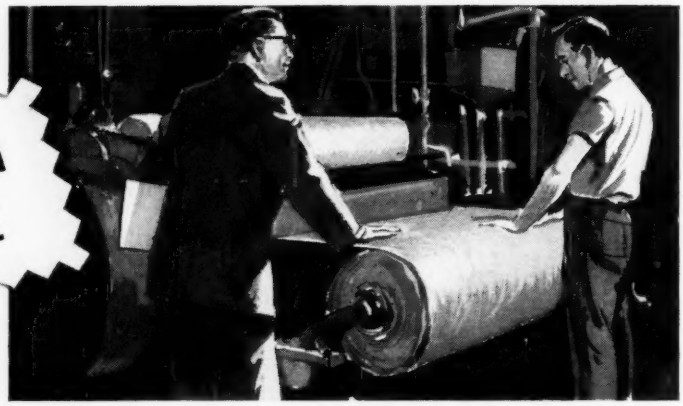
HOW TO SOLVE YOUR FINISHING PROBLEMS . . .



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AMERICAN
DYESTUFF REPORTER

Volume 48 May 4, 1959 Number 9

Historical Notes (No. 16)———

— THE THIRTEEN KEYS —
Hints on Studying the History of Dyeing and Bleaching

SIDNEY M EDELSTEIN

Dexter Chemical Corporation
New York, N Y

This is the sixteenth in a series of historical articles which the textile chemist and colorist will find of interest.

The author, a prominent science historian, is the founder of an outstanding collection of great works, documents and letters in the history of chemistry and related sciences.

Articles and illustrations in this series are from the author's library.

EVER since these "historical notes" first appeared, readers have asked: "Where do you get your information?" "How do you go about collecting your books?" "How do you know what is important?" and sometimes, "How can I get started?" Since most people are reticent about asking questions, there must be many in our industry who have a latent interest in studying the history of dyeing and bleaching and even some who would like to become collectors in this field. Perhaps some of the things that I have learned may help these persons get started in this exciting pursuit, and should satisfy the curiosity of the others.

The main sources of information on the history of dyeing and bleaching are books—new books—old books—all kinds of books. Often, however, we need more intimate material—manuscripts. Surely the actual hand-written records of Chevreul's work on dyeing at the Gobelins Tapestry Works would tell us more about the man and how he worked than would the printed volume on the same subject.

We must also remember that as far as the history of civilization is concerned, printing is a comparatively new invention. Dyeing, however, was carried on in a comparatively advanced manner thousands of years before the invention of printing. While most of the very old methods of dyeing and bleaching have come down to us and have finally been discussed in many printed books, our only source of exact knowledge is manuscript material.

Finally, we need collateral material to get "the feel" of the times and the people. Besides books and manuscripts we need pictures and medals and letters and pamphlets and broadsides and advertisements and sample books—anything and everything connected with dyeing and bleaching.

Most of the items that we require are in a sense "antiques." The odds of walking into some old bookshop or antique store and finding a first edition of Rosetti's "Plictho," however, is at least a million to one. For the most part we shall have to depend on the specialist antiquarian book-seller. This person might specialize in science, in textiles and costume, in technology, in Americana or in a thousand and one other specialties. There are antiquarian book dealers who cover many fields and some large firms deal in millions of dollars worth of rare books of all types. Most of these large dealers issue special catalogues on science, technology and other subjects from time to time. It is in the specialized subject catalogues of the specialists and the big dealers that we are most likely to find our material listed.

Figure 1
Title page of very rare first edition of "Plictho," Venice, 1540

One of the wonderful things about book collecting is that it may be pursued in the comfort of one's own home. For the most part, dealers exhibit their wares not by having callers come to their store or office, but through the medium of a list, letter or catalogue. The book dealer's catalogue is the hunting ground par excellence for the collector of books and manuscripts. This is true not only for the man looking for rare bindings or books on literature but for those of us who are interested in the history of dyeing, bleaching and finishing.[1]

Book and manuscript collecting has its own language. In addition, many of the special words have their own abbreviations. Since the main communication between the dealer and the collector is through a catalogue or a book list, the would-be collector will have to learn this language and the main abbreviations.[2]

[1]The "Bookman's Yearbook," published annually by Antiquarian Bookmen, 42 Walnut Street, Newark, New Jersey, lists dealers with their specialties, various auction houses and contains much useful information.

[2]John Carter's, "ABC for Book Collectors," published by Alfred A Knopf, New York, 1951, is especially recommended for the beginner..

Figure 2
Jean Baptiste Colbert, comptroller general of finance, publisher of famous "Instruction Generale"

When we see an item listed in a catalogue as being the first or second edition, how do we know that the information is correct? How do we find out what books were written by any particular author? How do we find out the various editions and translations that were published for any particular work? For the most part, our information along these lines will have to come from bibliographies. There are many types of bibliographies. There are bibliographies which list books published in a particular country, in a particular locality or written by a particular author. There are also bibliographies of books concerned with a particular subject or field. The latter type will be our main concern.

As far as we know, there is no complete bibliography devoted both to dyeing and bleaching. The nearest thing to this is "A Bibliography of Dyeing and Textile Printing," by L G Lawrie, published by Chapman and Hall, London, 1949. A bibliography to be really satisfactory to the collector should list books which the bibliographer has actually examined. Unfortunately, this is not the case with the small volume written by Lawrie. The author points out that his information was obtained by examining catalogues in libraries and book lists. As would be expected, he repeats many errors that were in the lists he examined. Another deficiency in Lawrie's volume is the fact that generally it only lists the author and the title of a work. Detailed bibliographical information, such as the number of pages of the volume, the publisher and other useful material, is not given.

As an example of the type of error that will be found in Lawrie, let us refer to a particular famous work. In 1683, in Germany, there was published a book under the title "Ars Tinctoria Fundamentalis, oder Grundliche Anweisung zur Farbekunst." This book was the first German translation by George E Stahl of the important "Instruction Generale" published in Paris in 1671. The publisher of the book in Germany was Paul Jacob Marperger. Many other editions of this German translation were published in 1685, 1703, 1730 and in other years. Now, Lawrie lists the book under different titles and with different authors and thus gives the idea that each is a different book. Item 13 in Lawrie lists the book under "Ars Tinctoria Fundamentalis" with Paul Merperger as the author. Item 694 shows the book written by Stahl and entitled, "Grundliche Anleitung zur Farbekunst." Many others errors, some worse and some not quite as bad, will also be found in the volume. Nevertheless, Lawrie is useful as a starting point for our work, as long as we use it with caution.

Since Lawrie is neither complete nor accurate, what next? Well, many of the books on dyeing and bleaching are actually books on technical chemistry and many of their authors were also chemists and wrote books on chemistry. Therefore, bibliographies of chemistry can often give us more accurate and more detailed information. Perhaps of first importance among these is, "A Select Bibliography of Chemistry," by Henry Carrington Bolton, published by the Smithsonian Institute, Washington, 1893, with supplements in 1899 and 1904. Bolton's listings are divided up under various headings which include bibliography, history of chemistry, biography and pure and applied chemistry. The books on dyeing are listed under pure and applied chemistry. While the bibliography of Bolton is a collector's item itself today, it is usually available at the larger city and university libraries.

Two other excellent bibliographies concerned with chemistry are—John Ferguson's "Bibliotheca Chemica," published in Glasgow in 1906, and Denis Duveen's "Biblioteca Alchemica," published in London in 1949. Ferguson's work is particularly strong in 16th and 17th century books on alchemy and chemistry, but contains very little on dyeing. Duveen's volume not only lists works on chemistry and alchemy, as does Ferguson, but also works directly concerned with dyeing. Both Ferguson and Duveen give detailed bibliographical information and are particularly important from this standpoint.

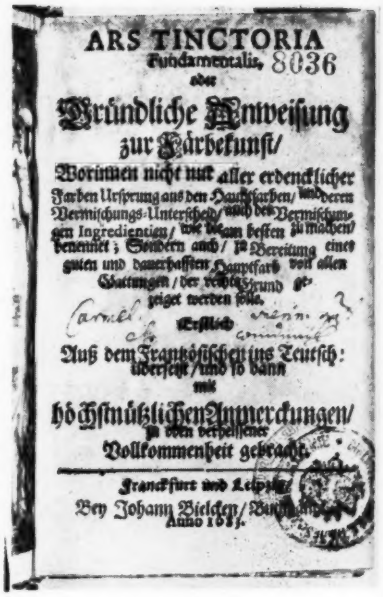
ARS TINCTORIA
Fundamentalis, 8036
oder
Gründliche Anweisung
zur Färbekunst/
Worinnen nicht nur aller erdencklicher
Farben Ursprung aus den Hauptfarben/ und deren
Vermischungs-Unterscheid/ auch den Vermischungen
Ingredientien/ wie dem besten zu machen/
benennet; Sondern auch/ zu Bereitung eines
guten und dauerhafften Hauptfarb von allen
Gattungen/ der rechte Grund ge-
zeiget werden solle.
Erstlich
Auß dem Frantzösischen ins Teutsch:
übersetzt/ und so dann
mit
höchstnützlichen Anmerckungen/
zu vollen vervollkommenheit gebracht.
Franckfurt und Leipzig/
Bey Johann Bielcken/ Buchhändler/
Anno 1683.

Figure 3
Title page of first edition of Stahl's translation of "Instruction Generale", 1783

In the final analysis, none of the bibliographies will be completely satisfactory for us in studying the history of dyeing and bleaching. Those that we have mentioned will be helpful. There still remains the need for a detailed and accurate bibliography of books on dyeing and bleaching.

Now, our main knowledge of the history of dyeing and bleaching should come from the actual written or printed original works themselves. No one however can read every original work and we must therefore make use of secondary sources or "histories." As far as I have been able to discover, there is no completely satisfactory book devoted even to the history of dyeing, let alone to the history of dyeing, bleaching and finishing. This does not mean however that there are not many fine books on the history of chemistry, technology, or even on certain phases of dyeing or bleaching which are of use in our studies.

"The Earliest Chemical Industry" by Charles Singer, London, 1948, has a wealth of information concerning the history of dyeing and much important related material. Actually, this book is devoted to the history of alum but since alum's main use through the ages was as a mordant in dyeing, Singer had to devote a great deal of his historical research to dyestuffs and dyeing. His information on dyeing in the middle ages

Figure 4
Pierre Joseph Macquer, author of the classic on dyeing of silk, "Art de la Teinture en Soie"

is particularly important and useful.

The recently published "A History of Technology," by A J Holmyard and A R Hall, in five volumes, Oxford, 1954-1959, contains information on bleaching, dyeing, tanning, spinning, weaving and their interrelationships. The volume by J R Partington entitled "Origins and Development of Applied Chemistry," London, 1935, contains useful information on ancient dyes and chemicals. The "Chemical Revolution" by Archibald and Nan Clow, published in London in 1952, has many chapters devoted to dyeing, calico printing, and the manufacture of dyestuffs and mordants in Great Britain, "The American Chemical Industry," by Williams Haynes, in six volumes, New York, 1945-1954, is unquestionably the best source of information on American dyestuff companies, on the history of the development of the dyestuff industry in the U S and on dyeing and related technology in the United States, from the Colonial period down to the present date.

Finally, we should not neglect the books on dyeing or bleaching themselves for they usually have a chapter devoted to the history of the subject. This is particularly true with some of the older books on dyeing and bleaching. Particularly useful are the chapters on history in Berthollet's 'Dyeing' and in Bancroft's "Permanent Colours."

The number of books on dyeing published from 1500 to 1856, (the year of Perkin's discovery of Mauve), listed by Lawrie, amount to about 260. Since Lawrie missed many items, the total number of books on dyeing published between 1500 and 1856 was probably twice this amount. In addition, there were also many books published during this period devoted to bleaching, finishing and related textile subjects.

Now, one would think that in order to have a real understanding of the development of the theories and the methods of dyeing and bleaching from the earliest times down to the year 1856, we would have to be familiar with the contents of most of these books. Actually, however, only a small percentage of these books contained original material or were particularly important in influencing the development of the art and science of dyeing and bleaching. Most were simply retranslations or digestions of a few outstanding and important works published through the centuries. The main story of the development of dyeing and bleaching from the earliest times down to the middle of the last century, therefore, can be traced by the study of a relatively small number of original key works —thirteen to be exact.

These books were published in many editions, translated into many languages, digested and twisted around and often republished as the work of different authors. Not only did these key books have an important place in the history of dyeing and bleaching but for the most part, the authors themselves were

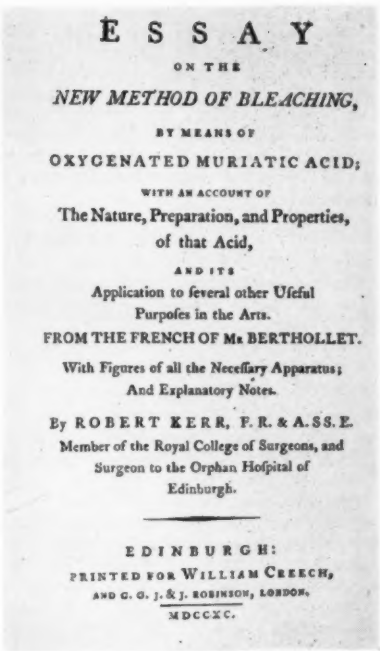
ESSAY
ON THE
NEW METHOD OF BLEACHING,
BY MEANS OF
OXYGENATED MURIATIC ACID;
WITH AN ACCOUNT OF
The Nature, Preparation, and Properties,
of that Acid,
AND ITS
Application to feveral other Uſeful
Purpoſes in the Arts.
FROM THE FRENCH OF Mr BERTHOLLET.
With Figures of all the Neceſſary Apparatus;
And Explanatory Notes.
By ROBERT KERR, F.R.&A.SS.E.
Member of the Royal College of Surgeons, and
Surgeon to the Orphan Hoſpital of
Edinburgh.
EDINBURGH:
PRINTED FOR WILLIAM CREECH,
AND G. G. J. & J. ROBINSON, LONDON.
MDCCXC.

Figure 5
Title page of rare first separate edition of Berthollet's work on bleaching with chlorine

key figures in the development of new ideas not only in dyeing and bleaching but in chemistry, economics and politics.

Since no single publication has specifically picked out these key books and given correct detailed bibliographical information about them, it was felt that such a detailed listing would be of help and interest to many beginners in the field. Many of these books are almost unattainable today. A few are fairly common. Many exist in second or third editions which are quite common and which are certainly satisfactory for study. The detailed bibliographical information furnished below also will serve to help the beginner in the field to recognize the many errors which are common in bibliographies such as Lawrie's as well as in many books and articles on dyeing and bleaching.

BIBLIOGRAPHICAL DESCRIPTION OF THE THIRTEEN KEY BOOKS IN THE HISTORY OF DYEING AND BLEACHING PUBLISHED BEFORE 1856, THE YEAR OF PERKIN'S DISCOVERY OF MAUVE

1.
ROSETTI (Gioanventura).

Plictho De Larte De Tentori Che Insegna Tenger Pani Telle Banbasi Et Sede Si Per Larthe Magiore Come Per La Comune (at the end;) Composto per Gioanventura Rosetti . . . In Venetia per Francesco Rampazetto. 1540.

4to. woodcut title + 41 leaves + 2 leaves. index. 2 woodcuts in text.

First edition.
Other editions: Venice; 1548, 1565, 1611, 1672.
French translation; "Le Teinturier Parfait," Paris; 1716.
Lawrie #612. Gives incorrect title.

This is the first printed book on dyeing describing the art as it existed in Europe. An earlier printed book on dyeing and spot removing appeared in Germany in 1532 but this included only a few recipes—mainly for home use. "Plictho" describes the formulae and techniques used in the most

famous dyehouses of Europe and the near east. Rosetti between 1525 and 1540 visited the dyeing works in Syria, Naples, Rome, Florence, Siena and Genoa, collected formulae and met the master dyers of the time. He discusses mordants and the origin of the dyestuffs. Hundreds of recipes for dyeing various colors on different fibers and leather are given. No satisfactory meaning for the word "Plictho" is known. This book was considered to be of practical importance to dyers for almost two hundred years after its first publication.

2.

INSTRUCTION GENERALE

Instruction Generale Pour La Teinture Des Laines Et Manufactures de laine de toutes couleurs, & pour la culture des drogues ou ingrediens qu'on y employe. A Paris, De l'Imprimerie de Francois Muguet, Imprimeur du Roy & de Monseigneur l'Archevesque rue de la Harpe, a l'Adoration des trois Rois. 1671.

12mo. 175 pp. 8 leaves.

First edition.

Other editions: "Le Teinturier Parfait," Leyden; 1708. Paris; 1716. "Ars Tinctoria Fundamentalis," (German Translation by G E Stahl), Frankfurt and Leipzig; 1683. English translation; 2nd part of "The Whole Art of Dyeing," London; 1705.

Duveen p 306.

Lawrie #126. Claims editions: 1669, 1672, 1708, 1737. No mention of the above. Internal evidence indicates edition of 1671 is 1st edition. Lawrie attributes the work to Colbert assisted by D'Albo.

Bancroft (Permanent Colours, Vol. I. 1813, p XLIX): "This set of regulations was brought out by the French Minister Colbert, not only to inform but as a Legislative Act, to control the dyers in their operations." The dyers were divided into two classes: "The one, dyers 'en grand', who were confined to the colours deemed lasting, while the dyers 'en petit teint' were allowed only to give those which were considered as fugitive: The drugs to be employed in each branch being also particularly specified."

This volume with its regulations laid the foundation for the great dyeing industry of France. The original act for regulating the dyeing industry was signed in 1669 and published in the same year. The "Instruction Generale" was written to implement the carrying out of the act and was not published until 1671. Reference to a "1669" edition apparently refers to the original act and not to the "Instruction Generale."

3

HELLOT (Jean)

L'art De La Teinture Des Laines, Et Des Etoffes De Laine, En Grand Et Petit Teint. Avec une Instruction sur les Debouillis. Par M Hellot, de l'Academie Royale des Sciences, & de la Societe Royale de Londres. A Paris, chez: La Veuve Pissot, Libraire, Quay de Conty, a la Croix d'Or: Jean-Thomas Herissant, rue S Jacques, a S Paul & a S Hilaire: Pissot, fils, Quay des Augustins, a la Sagesse. 1750. Avec Approbation & Privilege du Roy.

12mo. 12 leaves. 631 pp.

First edition.

Other editions: Paris; 1786. Italian: Verona; 1791. German: Altenberg; 1765. English: Part I of "The Art of Dyeing Wool Silk and Cotton," London; 1789.

Lawrie #303.

Not in Duveen.

Bolton I, p 521.

Berthollet, "Elements of the Art of Dyeing," London, 1824. Vol I, p 29: "Hellot published a methodical description of the processes which are practiced in the dyeing of wool, which forms still the best treatise we possess on this subject."

4.

HOME (Francis)

Experiments On Bleaching. By Francis Home, MD, Fellow of the Royal College of Physicians in Edinburgh. Edinburgh: printed by Sands, Donaldson, Murray, & Cochran for A Kincaid and A Donaldson. 1756.

8vo. vi + 330 pp.

First edition.

Other editions: Dublin; 1771. German Translation: Leipzig; 1777. Spanish Translation: Madrid; 1779.

Not in Lawrie.

Not in Duveen.

Bolton I, p 540, 1st supplement, p 217.

Edelstein, *Am Dyestuff Reptr* **36**, p 523, 1947. "This book which was probably the first on bleaching, paved the way for the great chemical advances in the art which took place at the end of the 18th century." See also *Am Dyestuff Reptr* **44**, 681-684, 1955.

5.

MACQUER (Pierre Joseph)

Art De La Teinture En Soie Par M. Macquer, 1763. No place, (Paris?). No printer given.

Folio. X, 86 pp. 6 plates.

First edition.

Other editions: German: Berlin; 1764. Dutch: Dordrecht; 1791. English: Part II, "The Art of Dyeing Wool, Silk and Cotton," London; 1789.

Lawrie #435 gives 1X + 86 + 6 plates.

Not in Duveen.

Bolton I, p 646, mentions 8 vo edition, Paris, 1763.

This was published as part of "Descriptions Des Arts et Metiers." See Arthur H Cole and George B. Watts. "The Handicrafts of France as Recorded in the Descriptions des Arts et Metiers 1761-1788." Cambridge, Mass, 1952. Berthollet, "Elements of the Art of Dyeing," London, 1824, says "Macquer gave an exact description of the processes executed on silk: He made known the combinations of the colouring principle of Prussian blue: He tried to apply its use to dyeing: And he furnished a process for imparting to silk brilliant colours by means of cochineal."

6.

DELORMOIS

L'Art De Faire L'Indienne A l'instar d'Angleterre, Et de composer toutes les couleurs, bon teint, propres a l'Indienne. Suivi de la facon de faire toutes les couleurs en liquer, pour peindre sur les etoffes de soie, pour la mignature, le lavis des plans, & pour colorer les bois, les plumes, la paille, le crin, etc. Par M Delormois, dessinateur du roi, & coloriste. A Paris, Chez Charles-Antoine Jombert, Libraire du Roi, rue Dauphine, 1770. Avec Approbation & Privilege du Roi.

12 mo. XXIII + 94 pp.

First edition.

Other editions: Paris; 1786, 1790. Italian: Firenze; 1771. Venice; 1775.

Lawrie #148.

Not in Bolton.

Ferguson, "Bibliographical Notes," 3rd supplement, p 66. "This is a treatise on calico printing and dyeing. It describes the designing of the patterns, the method of printing, and the receipts for the colours. In the second part are given receipts for liquid colours, or, as they are called, 'The Secrets of the Composition of the Colours'.—It interests the calico-printer and chemist alike, but it deals with printing rather than with dyeing."

This is probably the first book published on Calico Printing.

O'Brien in the introduction to his "Calico Printer's Assistant," London, 1790-1792, says of his own book, "It is likewise suggested, that as this is the first publication of the

kind, and indeed the first ever offered concerning calico printing—The writer has heard of something of this nature in France, but he understands it to be more a description of the business than on the plan of this publication. He however, will not insist that his is the only one: He may possibly, be mistaken, although he has closely enquired concerning it."

7.

LE PILEUR D'APLIGNY

L'Art De La Teinture Des Fils Et Etoffes De Coton, Precede d'une Theorie nouvelle des veritables causes de la fixite des couleurs de bon Teint, & suivi des Cultures du Pastel, de la Gaude & de la Garance. A Paris Chez Moutard, Libraire de la Reine, Quai des Augustins, 1776. Avec Approbation & Privilege du Roi.

12 mo. XVI + 204 pp + 63 pp + 1 leaf.

First edition?

Other editions: Paris; 1798, 1801, 1807. English translation: Part III of "The Art of Dyeing Wool, Silk and Cotton," London; 1789.

Lawrie #408, gives same title and date with different spelling for several words and folio instead of 12 mo—Also different pagination.

Not in Bolton, Ferguson or Duveen.

Ciba Rev #18, p 636. "In 1776 Le Pileur D'Apligny attempted to supplement the work of Hellot and Macquer by a treatise on the third branch of dyeing which till then had been excluded from research. The attempt was premature, as the whole cotton industry was too young. Neither the value nor the success of Le Pileur's book can be compared with those of Hellot or Macquer, and it was entirely superseded by Chaptal's treatise on the same subject. Le Pileur D'Apligny could, however, claim the credit of being the first to have given an accurate description of Indian red, which was widely used by the industrialists of Rouen."

8.

BERTHOLLET (Claude Louis)

Essay On The New Method Of Bleaching, By Means Of Oxygenated Muriatic Acid; With An Account Of The Nature, Preparation, and Properties, of that Acid, And Its Application to several other Useful Purposes in the Arts. From The French Of Mr Berthollet. With Figures of all the Necessary Apparatus; And Explanatory Notes, by Robert Kerr, F R & A SS E. Member of the Royal College of Surgeons, and Surgeon to the Orphan Hospital of Edinburgh. Edinburgh; Printed for William Creech and G G J & J Robinson, London, 1790.

8 vo. XXVII + 139 pp. 1 folding plate.

First separate edition.

Duveen, p 74.

Lawrie #56 describes second edition, London, 1791.

Actually the first English is also the first separate edition. It is a translation of the paper by Berthollet on pp 151-190, Annales de Chimie, Vol II, Paris, 1789. This is the first book on bleaching with chlorine. Berthollet is credited with introducing the use of chlorine for the practical bleaching of cotton and linen.

9.

BERTHOLLET (Claude Louis)

Elements De L'art, De La Teinture, Par M Berthollet, docteur en medecine des facultes de Paris & de Turin, des academies des sciences de Paris, Condres, Turin, Harlem & Manchester. A Paris rue Dauphine, No. 116, Chez Firmin Didot, libraire pour l'artillerie & le genie, 1791.

2 vols. 8 vo. I: VIII, XLVIII, 311 pp; II: VII, 365 pp.

First edition.

Other editions: Second edition, Paris, 1804, with A B Berthollet. 1st English: Translated by William Hamilton, London, 1791. Other English translations, Edinburgh, 1792, 1793. English translation of 2nd French edition by Andrew Ure, London, 1824 and 1841: 1st German translation by Hermbstadt, Berlin, 1806.

Lawrie #51, #52, #53, #54, #55. He wrongly attributes the first edition to father and son. The son actually appears as coauthor in 2nd French edition of 1804.

Duveen, p 74, shows two issues of 1st French edition. "The First Modern Book on Dyeing and the first General Theory of its principles."

10.

BANCROFT (Edward)

Experimental Researches Concerning The Philosophy of Permanent Colours: And The Best Means of producing, by Dying, Callico Printing &c, by Edward Bancroft, MD, Fellow Of The Royal Society, &c. Vol I. London: Printed For T Cadell, Jun, and W Davies, 1794.

8 vo. XLVII + 456 pp.

First edition.

Other editons: 2nd English: London; 1813. Philadelphia; 1814. German edition: Berlin; 1817-18.

The first edition consists of Vol I only. The second edition contains the original Vol I with added notes and an additional volume.

Lawrie #26, #27 is in error in indicating 2 volumes in first edition.

Bolton I, p 281, 1st supplement p 75.

Edelstein, *Am Dyestuff Reptr* 43, 712-735, 1954.

"Bancroft's second great contribution was the publication of 'Experimental Researches Concerning the Philosophy of Permanent Colours'—reading Bancroft's work today—Bancroft's thoughts and research methods such as reasonable and as practical as the best we use today."

11.

CHAPTAL (Jean Antoine Claude)

L'Art De La Teinture Du Cotton En Rouge, Par M JA Chaptal. Membre et Tresorier du Senat, Grand-Officier de la Legion d'Honneur. Membre de l'Institut de France, Professeur honoraire de l'Ecole de Medecine de Montpellier, etc, etc, etc. Avec Planches En Taille Douce De L'Imprimerie De Crapelet. A Paris, Chez Deterville, Libraire, rue Hautefeuille, No8, au coin de celle des Potevins. 1807.

8 vo. XI + 172 pp + 4 folding plates.

First edition.

Other editions: German: Aarav; 1807. Leipzig; 1807.

Lawrie #112, #113, #114.

Bolton, p 361.

Ciba Rev #18, p 640. "In spite of the publication of Lepileur D'Apligny's treatise, cotton-dyeing was comparatively rare: It was considered a difficult process and was confined to few colours. Chaptal owned factories at Rouen, and was beginning to extend his activities to dyeing. He gained experience and made experiments which resulted in his treatise 'L'Art de La Teinture du Cotton en Rouge', the first publication to have due regard to the peculiar constitution of cotton as a vegetable fibre, though like Hellot's and Macquer's manuals, it consisted mainly of dyeing recipes."

12.

PERSOZ (Jean Francois)

Traite Theorique Et Pratique De L'Impression Des Tissus, Par J Persoz, Professuer a la Faculte des Sciences de Strasbourg, professeur-directeur de l'Ecole de pharmacie de la meme ville. Ouvrage Avec 165 Figures Et 429 Echantillons Intergales dans Le Texte, Et Accompagne d'un Atlas in 4 de 20 planches. Paris. Victor Masson, Libraire Des Societes Savantes Pres Le Ministere De L'Instruction Publique, Place De L'Ecole-De-Medecine; Meme maison, chez L Michelsen, a Leipzig. 1846.

4 vols. 8 vo. 1 volume (Atlas) 4 to.

I: LX + 569 pp. II: 588 pp. III: 458 pp + 32 pp of catalogue. IV: 560 pp, Atlas; 33 leaves.

First edition.
Other editions: German: Weimar; 1848, 1852.
Lawrie #534, #536.
Bolton p 732, 1st supplement, p 331.
This is the classic work on textile printing. It contains details for practically all processes for a variety of styles and colors. The 4 volumes show the state of the art in all its complexity just before the introduction of the "Coal tar" dyestuffs.

13.
DUMAS (Jean-Baptiste)

Precis De L'Art De La Teinture Par M Dumas, Membre De L'Institut Royal (Academie Des Sciences) Et De L'Academie Royale De Medecine, Doyen De La Faculte De Medecine Et L'Ecole Centrale Des Arts Et Manufactures, Membre De La Societe Royale De Londres Et De L'Academie Des Sciences De Stockholm, Correspondant Des Academies De Berlin, De Turin, De Saint-Petersbourg, De Moscou, De Copenhague, etc. Paris. Bechet Jeune, Libraire-Editeur, Place De L'Ecole De Medecine, No. 1, 1846.
8 vo. VIII + 416 pp.
First edition.
This is vol VIII of Dumas' "Traite de Chimie Appliquee aux Arts" begun in 1828. This is last volume.
Other editions: German: Nurnburg; 1850. Spanish: Madrid; 1848.
Lawrie #174.
See Duveen p 185.
Bolton p 416.
This work contains detailed references to the literature which was unusual for a book on dyeing. It has a clear scientific outlook and presents both theory and practical formulas.

Abstract

The Influence of Bleaching on Dyeing

Anon, *Dyer* 121, 27-30, Jan 2, 1959

At every stage of preparatory treatment for subsequent dyeing there are factors which are detrimental to the application of dyestuffs. Singeing, desizing, washing, alkali-boiling and bleaching all contribute to the final result.

Streaks in piece-dyeing may be caused by improper singeing of the goods (worn plates or faulty heating). Gas singeing is considered the most efficient type. Over-singeing causes direct dyes to dye lighter and basic dyes darker.

For desizing, the author recommends treatment with an enzyme, followed by a cold and a hot wash, to remove all the size ingredients. A process for desizing in open width is described (for goods to be dyed with sulfur dyes) to avoid creases, frays, etc.

In the kier boil, faulty loading of the kier may cause rubbing of the cloth against the sides, resulting in irregular dyeing. Lining of the interior of the kier with cloth may be necessary. The liquor is best circulated from top to bottom of the kier. Uniform packing and heating of the cloth is necessary, to avoid uneven dyeing.

The continuous peroxide bleach has little effect on the wax content of the cotton, it is stated. Presence of residual wax may affect the behavior of the cloth in finishing.

"Neps," or immature fibers, when present in cotton goods, will not dye by normal methods. Mercerizing the cloth will sometimes minimize the trouble.

Excessive oxidation in bleaching gives rise to formation of acidic oxycellulose (eg, by introduction of air in the kier), resulting in a lower absorption of direct dyes at the parts affected. Dyeing of such goods in a slightly acidified dyebath is said to produce more level results. Formation of oxycellulose can be prevented by proper control of the bleaching process. It is further stated that it can be completely avoided by bleaching with sodium chlorite, which has no chemical action on cellulose but only on the impurities in the fiber. However, bleaching with chlorite involves certain health hazards.

In bleaching with hypochlorite the best results are obtained at a pH of 5 or 9. Between pH 6 and 8 the cellulose is likely to be attacked. An addition of borax to the bleaching liquor, producing pH 9, is recommended.

The author also discusses peroxide bleaching of wool. He warns that in oiling the wool, too large a percentage of mineral oil will give trouble in subsequent dyeing and finishing. He recommends a blend of good quality oleine and not over 20% mineral oil, followed by thorough scouring.

Use of a sulfur stove for bleaching wool may give trouble from the sulfur dioxide fumes escaping into the surrounding air. Substitution of sulfur dioxide in liquid form is safer.

Numerous references to the literature are made.

General Calendar

AMERICAN OIL CHEMISTS SOCIETY
Sept 28-30 (Statler Hotel, Los Angeles, Calif)

AMERICAN TEXTILE MACHINERY ASSOCIATION
May 23-27, 1960 (American Textile Machinery Exhibition, Auditorium, Atlantic City, NJ)

CANADIAN ASSOCIATION OF TEXTILE COLOURISTS AND CHEMISTS (QUEBEC SECTION)
June 20 (Annual Golf Tournament)

DRUG, CHEMICAL AND ALLIED TRADES SECTION, NY BOARD OF TRADE
Sept 17-20 (69th Annual Meeting, Sagamore Hotel, Bolton Landing, Lake George, NY

GORDON RESEARCH CONFERENCE ON TEXTILES
July 13-17 (Colby Jr College, New London, NH)

KNITTING ARTS EXHIBITION
May 4-8 (Atlantic City Auditorium, Atlantic City, NJ)

NATIONAL COTTON COUNCIL
May 12-14 (1959 Cotton Research Clinic, Grove Park Inn, Asheville, NC)
Oct 7 (Chemical Finishing Conference, Mayflower Hotel, Washington, DC)

PURDUE INDUSTRIAL WASTE CONFERENCE
May 5-7 (Purdue Memorial Union Bldg, Purdue Univ, Lafayette, Ind)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
June 9, Sept 15, Oct 13, Nov 4 (Luncheon meetings at the Hotel Roosevelt, New York, NY); May 11-13 (Spring Outing—The Cavalier, Virginia Beach, Va); Dec 2 (Annual meeting and dinner—Hotel Roosevelt, New York, NY)

TEXTILE RESEARCH INSTITUTE
March 24-25, 1960 (30th Annual Meeting, Hotel Commodore, New York, NY)

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Hudson-Mohawk Section———

DYEING AND FINISHING BLENDS OF DACRON POLYESTER FIBERS AND CELLULOSE FIBERS*

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INTRODUCTION

IT IS the purpose of this paper to present the technology in use today for dyeing Dacron Type 54 polyester fiber in blends with cotton and with rayon and for dyeing the new Dacron Type 64 in blends with rayon. The selection of dyes for use on these blends will be emphasized.

In blends with cellulosic fibers, Dacron imparts durability, quick-drying properties, and the need for little or no ironing. These are some factors which have contributed to the increased demand for Dacron and have necessitated the construction of additional production facilities at Old Hickory, Tenn, to supplement those at Kinston, NC.

This ready acceptance of fabrics of Dacron by the consumer in an ever-increasing range of colors, constructions, and textures would have been impossible without the splendid cooperation of the spinners, weavers, and, particularly, the dyers and finishers.

The success of fabric made of 65/35 blends of Dacron and cotton in shirtings, blouses, lingerie, pajamas, rainwear, suitings and dresswear has been followed by a marked interest in blends of Dacron and rayon in suits, slacks, uniforms, and children's outerwear. Of growing importance in these uses are fabrics made of Dacron and flax and Dacron and Cordura rayon textile yarn.

The recently announced Dacron Type 64 polyester fiber, which was engineered for worsted and rayon suiting blends, offers improved resistance to pilling in addition to the excellent aesthetic performance characteristics of Dacron Type 54. It also offers certain advantages in dyeing. Blends of Dacron Type 64 and rayon in single yarns are of interest for the production of such fabrics as sheen gabardines. Dacron Type 54 will continue to be produced and is recommended for blends where there is no particular advantage in the Type 64 over Type 54.

Many blends containing varying amounts of Dacron and cellulosic fibers have appeared on the market; some of these have contained insufficient Dacron to give the consumer the expected performance. It should be emphasized that, with the exception of rayon blend suitings, at least 65% Dacron is recommended for use in blends with all cellulosic fibers in rayon blend suitings, at least 55% Dacron in both directions is recommended. Generally speaking, the more Dacron used above these guide levels, the greater the consumer benefits.

PREPARATION FOR DYEING

In the preparation of blends of Dacron Type 54 and cotton or rayon and blends of Type 64 and rayon, only slightly modified procedures from those used in processing all-cotton or all-rayon fabrics are required. The gray singe is omitted because the tiny melt balls formed on the fabric surface absorb dye readily and leave the dyed fabric with a speckled, uneven appearance. A gray singe would also tend to set any grease or oil on the goods into the fabric. When starch is present, the fabric is desized in the normal way prior to scouring. Fabrics that are heavily soiled are given a preliminary solvent emulsion scour using one to two percent by volume of xylene or Varsol[1] with soda ash and detergent. To inhibit wrinkle formation in subsequent dyeing, heavyweight fabrics are set or grabbed in the open width, eg, in a Hinnekens or Tensitrol washer, at the highest temperature feasible. Since high temperatures tend to set stains in the fabric, it may be desirable to prescour the goods for about 20 minutes at 100 to 120°F prior to setting to remove a large portion of the size, dirt, oil, grease, and tint. After setting, but before dyeing, the fabric should be scoured in a fresh detergent solution for 30 minutes at 160°F. If a crabbed fabric creases during the dyeing, it may be necessary to preheat-set at 325°F in a roller-type dryer or curing oven.

Fabrics of Dacron and cotton should be mercerized to give the cotton component luster, increased dyeability, and dimensional stability. Caustic kier boiling under pressure will degrade Dacron and should be avoided. Continuous J box caustic boil-offs will not degrade Dacron provided normal caution is exercised in establishing conditions of concentration, time, and temperature. Fabrics of Dacron and cotton to be bleached in a kier or J box should be preheat-

* Presented by R J Thomas before the Hudson-Mohawk Section at Tribes Hill, N Y, on November 14, 1958.

[1] These solvents are toxic and flammable and should be handled with care.

set at 325 to 350°F. Permanent creases due to packing during bleaching will occur otherwise. The Du Pont Solomatic continuous bleaching system can also be used satisfactorily for these fabrics.

DYEING METHOD

Procedures for dyeing the Dacron Type 54 in the foregoing blends are now well established along two lines:

1) Dyeing yarn in package form at 250°F without a carrier or at 205 to 208°F with a carrier; and
2) Dyeing fabric from aqueous baths containing a carrier.

The practicability of another method, the Thermosol Method, for dyeing the Dacron Type 54 in fabrics has been demonstrated on long mill runs; this likely will become an established procedure in many plants when repeat business on specific shades in large volume dictates the need for continuous operation.

Where cotton is the other component of the blend, the use of vat dyes is ordinarily required. It is recognized, however, that where rayon is blended with Dacron, direct dyes will usually be applied, particularly if the fabric is to be resin-treated.

A) YARN DYEING ——— The yarn is first scoured and, if to be dyed a pastel shade, bleached. The bath is set at 130°F (eg, with Compound No. 8-S) and circulated. Disperse dyes previously pasted (eg, with 2.0% Compound No. 8-S) are added and the temperature rapidly raised to 190°F at which the pH is adjusted to ca 5[2] with acetic acid. The temperature is raised to 208°F and the bath circulated for 20 minutes; the temperature is then increased to 250°F and dyeing carried out for one hour. At the end of this time, the temperature is dropped to 200°F. (Where means of rapid cooling are not available, it may be preferable to drop part of the bath.) The dispersed vat pigment and caustic soda are added. The yarn is pigmented while cooling to dyeing temperature, then the reducing agent is added and dyeing is carried out on the cotton for 45 minutes. The bath is dropped, the yarn rinsed, oxidation carried out, eg, for 10 minutes at 120°F with 2.0% sodium perborate, and the yarn scoured for 15 minutes at 200°F, or, for heavy shades, preferably at 225°F, with 0.5 g/l caustic soda, 0.5 g/l sodium m-nitrobenzenesulfonate, and 0.5 g/l cetyl betaine, rinsed, and dried.

For application of a developed black shade to a 65:35 blend of Dacron and cotton, the bath may be set at 90°F (eg, with Compound No. 8-S), followed by the addition of 10.0% Latyl Developer B Solution. The liquor is circulated for five minutes and acetic acid added to bring the pH to 6.0 to 6.5. The liquor is circulated for five more minutes and a disperse, developed dye, eg, 2.5% Latyl Diazo Black B dispersed with 3.0% Compound No. 8-S, is added. The temperature is raised to 250°F and held for one and one-half hours. The bath is dropped, the package rinsed well and diazotization and coupling are effected in a fresh bath with 4.0% sodium nitrite and 8.0% sulfuric acid. Treatment is started at about 80°F and the temperature raised over 15 minutes to 180 to 190°F. Vat dyes are then applied to the cotton from a fresh bath in the usual manner.

Where high-temperature equipment is not available, the disperse dyes can be applied to the Dacron from a carrier bath at 205 to 210°F. At a concentration of 2.5 to 7.5 grams per liter, depending upon shade depth, a modified phenol derivative without pH adjustment or sodium salt of ortho-phenylphenol from baths adjusted to pH 5.5 is recommended. Chlorinated benzenes, diphenyl and methyl salicylate are also used as carriers, but with these it is imperative that the dyehouse be adequately ventilated because of toxicity and odor problems.

To apply a developed black to yarn packages from a carrier bath at 205 to 208°F, a three-step process is recommended to produce optimum fastness. These steps are carried out in the following sequence:

1) Apply Latyl Diazo Black B from carrier bath,
2) Apply CI Developer 8 from a fresh bath acidified with 2.0% acetic acid (glacial) at 205 to 208°F,
3) Diazotize at 180 to 190°F, apply vat dyes, and scour as above.

B) DYEING FABRIC FROM AQUEOUS BATHS———When both components are to be dyed in light shades, the wet goods are loaded directly from the bleaching bath into a covered beck or jig where disperse dyes are applied to the Dacron from a carrier bath. A modified phenol derivative or a sodium salt of ortho-phenylphenol at a concentration of 3.5 to 5.0 grams per liter, at pH 5.5, is recommended. Subsequent to application of the disperse dyes, vat dyes are applied on the jig to the cellulose fiber component from reduced dyebaths, which tend to remove any disperse dye absorbed by the cotton or rayon. If sufficient yardage is involved, the material can be dried after application of the disperse dyes and vat dyes then applied by a continuous pigment-pad operation.

Heavy shades can be dyed by applying the vat dye first by pigment-padding and either jig or continuously developing. Scouring immediately after oxidizing can be omitted. The wet goods are transferred to a covered beck where the Dacron is dyed at 208 to 212°F in a bath containing 5.0 g/l modified phenol derivative or sodium salt of ortho-phenylphenol at pH 5.5. Use of Latyl Carrier A is advantageous in specialty work or in dyehouses where personnel are not too familiar with handling carriers. Closed stainless steel equipment is desirable, preferably with auxiliary steam lines to insure a high and uniform dyeing temperature. After dyeing, the goods are scoured for 15 minutes at 200°F with 0.5 g/l caustic soda, 0.5 g/l sodium m-nitrobenzenesulfonate, and 0.5 g/l cetyl betaine, then rinsed, extracted, and framed.

C) CONTINUOUS DYEING——— Where sufficient yardages are involved, the cellulose fiber component can be dyed with vat colors by the pad-steam process. In fact, pastel shades can be made economically by dyeing only the cellulose fiber with insoluble or soluble vat dyes. In well-blended fabrics, such dyeings generally exhibit satisfactory coverage. As the depth of shade increases, it becomes necessary to dye the Dacron, which is usually the major component of the blend, or both components. Dyeing of the Dacron by the Thermosol Process consists of padding the fabric blend with a thickened dispersion of the dye, drying, and finally fixing the dye on the Dacron by subjecting the fabric to temperatures between 400 and 425°F for 15 to 60 seconds.

There are several factors which affect the efficiency of dye fixation in the Thermosol Process. These include the dyes employed, the concentration of dye applied, the time, and the temperature of heat treatment. Under proper conditions, however, fixation is of a high order and the amount of dye fixed on the Dacron will frequently exceed 90 percent of that with which the fabric is impregnated *(1)*. Most of the disperse dye transfers from the cotton to the Dacron during the Thermosol treatment.

[2] In formulations containing Latyl Brilliant Blue 2G or Latyl Brilliant Blue BG, it is recommended that the pH be adjusted to about 4.

DYEING OF DACRON TYPE 64

It is expected that the recently announced Dacron Type 64, because of its improved pill resistance, will be used to a considerable extent in blends with rayon. Disperse dyes are applied to Dacron Type 64 by the same procedures used for Type 54 except that 3.0 g/l sodium sulfate (anhydrous) is added to dyebaths maintained at temperatures up to 212°F and 12.0 g/l to baths maintained at 250°F. This is required to prevent hydrolytic degradation of Dacron under the conditions of dyeing. The presence of such an agent tends to retard disperse dye absorption by the fiber; however, this tendency is counteracted by the improved affinity for disperse dyes which Dacron Type 64 exhibits over Type 54.

The procedure for applying a developed black on Dacron Type 64, in which Latyl Diazo Black B and Latyl Developer B Solution or CI Azoic Coupling Component 18 are applied at 250°F, is similar to that employed for Dacron Type 54 except that 12.0 g/l sodium sulfate is added to both the base-developer bath and the subsequent diazotization bath. If it is desired to apply a developed black at 208 to 212°F using CI Developer 8, a three-step process should be employed. Although 3.0 g/l sodium sulfate will suffice in the bath from which the base is applied, 6.0 g/l is required in the developer bath and 12.0 g/l in the diazotization bath. It has been observed that the presence of this salt retards absorption of the developer. Hence, the concentration of developer, with respect to the weight of fiber, must be increased as the dyebath volume is increased. For example, at 20:1, 3.0 to 4.0% CI Developer 8 is sufficient to produce a good black with 4.0% Latyl Diazo Black B, but at 40:1 it is necessary to employ 6.0 to 8.0% developer. In other words, approximately 2.0 g/l CI Developer 8 is required with 6.0 g/l sodium sulfate regardless of the dyebath ratio.

Unlike Type 54, Dacron Type 64 also has affinity for cationic dyes. These are of interest for producing economical black and navy shades, which exhibit good fastness to sublimation and to perchlorethylene spotting, and bright shades on ladies' wear. The lightfastness of cationic dyeings on Type 64 is inferior to that of disperse dyeings but is acceptable for ladies' wear. Again, sodium sulfate is required in the dyebaths. As with disperse dyes, a carrier should be used with cationic dyes. To avoid precipitation of the cationic dyes by direct dyes applied to the rayon, a two-step procedure must be used with the direct dyes introduced after the cationic dyes have been absorbed by the Dacron; in fact, in heavy shades a two-bath procedure is preferred.

The use of the nonionic Latyl Carrier A is recommended since in anionic carrier systems complexes can form with cationic dyes. When such complexes form, production of deep shades is impeded. Furthermore, in equipment having a short bath-to-fiber ratio, there is danger of cationic dyes precipitating with the anionic carrier. This precipitate deposits on the fiber surface and results in a poor dyeing which crocks excessively.

The following procedure is presently employed for heavy shades on blends of Dacron Type 64 and rayon:

1) Set a bath at 160°F with 0.5 g/l (0.07 oz/gal) nonionic surfactant, such as Alkanol HCS surface-active agent; 3.0 g/l (0.40 oz/gal) anhydrous sodium sulfate; and 5.0 to 8.0 g/l (0.67 to 1.07 oz/gal) Latyl Carrier A, previously pasted in a small amount of hot water. Run for 10 minutes to distribute the carrier.
2) Paste the dyes with acetic acid and dilute with hot water at 180°F. Add the dyes to the bath and run for 10 minutes at 160°F. Set the bath at a pH of 5.0.
3) Raise the bath temperature to the boil over a period of 30 minutes. Continue the dyeing at this temperature for a minimum of two hours until the desired shade is reached.
4) Cool slowly to 150 to 160°F, rinse thoroughly to remove carrier.
5) Scour with 0.5 g/l (0.07 oz/gal) Alkanol HCS for 20 minutes at 200°F. Rinse at 190 to 200°F. This method successfully removes Latyl Carrier A from the material and minimizes cationic dye stain on the rayon.
6) Dye rayon. In dyeing light shades, if direct dyes are to be applied to the rayon, they are added to the original dyebath after the cationic dyes have been substantially exhausted.

When Dacron Type 64 is dyed in top, stock or yarn form with Latyl Carrier A, where feasible, the bath should be dropped hot after dyeing. Several washes at 200 to 205°F, dropping the bath hot after each, will effectively remove carrier from the material.

SELECTION OF DYES

A) DISPERSE DYES FOR DACRON TYPE 54 AND TYPE 64———

1) *Leveling Action—Light Shades.* Generally, improved levelness is obtained on Dacron Types 54 and 64 by selecting dyes that are absorbed slowly. A controlled, slow temperature increase in the critical region, ie, above 180°F, and the addition of retarding agents to the dyebath will promote level dyeing. The following analogy will illustrate the problem of dyeing Dacron levelly. When dyeing rayon or wool, there is a 100°F rise in temperature during which dye absorption proceeds gradually. With Dacron, dye absorption is insignificant below 180°F, but above this proceeds rapidly. The uniformity of heating above 195°F is very critical.

Certain dyeing assistants are available that increase leveling action of the dyes by slowing down the rate of dyeing. Avitone T, at a concentration of 1.5 g/l, gives fairly good retarding and leveling action and may produce the required levelness in many cases. Where greater retarding action is desired, the addition of 0.25 to 0.50 g/l of a nonionic surfactant, such as Alkanol HCS, to the dyebath is recommended. Amounts of these agents in excess of those suggested should not be used since the dye would be held off the fiber.

Since unlevel deposition of dye is particularly evident in light shades, special attention must be given to the selection of dyes which are absorbed most slowly or which transfer. CI Disperse Yellow and the following Latyl disperse dyes are recommended for the production of light shades having good fastness on Dacron in blends with cellulose fibers: Yellow 3G, Cerise B, Cerise N, Violet 2R, Brilliant Blue 2G, and Brilliant Blue BG.

CI Disperse Yellow 2 is more level dyeing and has better lightfastness in light shades than Latyl Yellow 3G; as shade depth increases, the Latyl Yellow 3G is preferred since it exhibits better sublimation fastness than CI Disperse Yellow 2 and better build-up and working properties than Latyl Yellow YL. Latyl Cerise B and Latyl Cerise N dye levelly.

Latyl Blue FL, Blue 2R, Blue 4R,

and Violet BN are not ordinarily used in very light shades since these dyes strike fast and do not transfer appreciably. Latyl Brilliant Blue 2G and Violet 2R dye slowly and are considered the best in level-dyeing properties for producing blueness.

Latyl Brilliant Blue BG strikes somewhat faster than Latyl Brilliant Blue 2G and might be used with Alkanol HCS present as a retarding and leveling agent. Latyl Brilliant Blue BG begins to show build-up advantages over the 2G at about 0.5 to 1.0% strength (on weight of Dacron), although up to this concentration range they are both about equal in color value.

2) *Medium and Heavy Shades.* The dyes listed in Table I are recommended for use in the production of medium and heavy shades on Dacron.

TABLE I

Dye	Shades Medium	Heavy
CI Disperse Yellow 23	x	x
CI Disperse Red 5		x
CI Disperse Blue 9		x
Latyl Yellow 3G	x	
" Orange NST	x	x
" Orange 3R	x	x
" Scarlet FSW	x	
" Red GFS	x	
" Cerise B	x	x
" Cerise N	x	x
" Violet BN	x	x
" Blue 4R	x	x
" Blue 2R	x	x
" Brill Blue BG*	x	x

*Used in low concentrations to shade and to correct flare.

Latyl Yellow 3G or CI Disperse Yellow 23 can be used in heavy shades but are usually used where only a moderate amount of yellow is required for shading. Where high concentrations of a yellow element are needed, use of Latyl Orange 3R effects an economy. Where higher concentrations of a red element are required, the use of either Latyl Scarlet FSW or Latyl Red GFS should be considered. Latyl Cerise B and Latyl Cerise N are not generally recommended in concentrations exceeding 1.0% on the weight of the Dacron. The economical CI Disperse Red 5, because of poor lightfastness in light and medium shades, is used only in very heavy shades of charcoal, brown. black, midnight navies, etc. Latyl Violet BN, Blue 4R, and Blue 2R can supply most of the blue element required, with small amounts of Latyl Brilliant Blue BG to correct the red artificial light changes of these dyes. Latyl Blue 4R and Blue 2R exhibit superior fastness to sublimation but the Latyl Violet BN builds more satisfactorily to very heavy shades, eg, heavy navies and blacks. Latyl Blue 4R and Blue 2R require less Latyl Brilliant Blue BG to correct red artificial light flare than Latyl Violet BN; hence, economies are effected through their use. CI Disperse Blue 9 can be used as the blue element, particularly in deep shades where the combination of Latyl Violet BN and Brilliant Blue BG is more expensive. This is generally true when fairly heavy bright blues are required, such as for women's wear shades of blues and greens.

B) CATIONIC DYES FOR DACRON TYPE 64———Cationic dyes are superior to disperse dyes in sublimation, solvent-bleed, and many hot-wet fastness properties. At present, shortcomings in the range of cationic dyes having satisfactory lightfastness deter their use in medium depth shades for men's wear. Their brightness, however, makes them of interest for producing many shades on ladies' wear. Table II is a list of recommended cationic dyes.

TABLE II

CI Basic Yellow 11
CI Basic Yellow 13
Sevron Yellow GL*
" Yellow 3RL*
" Orange CL
" Brown YL*
" Red GL*
" Bordeaux G*
" Blue BGL
" Blue 5G*
Cationic Red TLX-423*
Cationic Red TLX-424*
CI Basic Green 1*
CI Basic Green 4*

*Good thermal stability; recommended for high temperature dyeing.

The economy resulting from the use of cationic dyes to produce navy and black shades is apparent from the dye costs of the typical formulas shown in Table III.

TABLE III

	Navy	Black
CI Basic Yellow 11	1.0	2.8
CI Basic Violet 14	0.4	0.5
CI Basic Green 1	0.5	0.8
Sevron Blue 5G	1.1	0.25
Dye cost per 100 lbs fiber	$12.70	$17.81

For production of comparable shades with disperse dyes, the dye costs would be $21.58 and $27.37, respectively. Dye costs for a developed black would be $11.30.

C) DYES FOR CELLULOSE FIBERS IN BLENDS WITH DACRON———

1) *Vat Dyes.* In order to obtain maximum fastness, vat dyes should be applied to the cellulose fiber in the blend. The particular vat dyes employed to produce the desired shade should also be carefully selected to impart optimum Fastness. Either of two application procedures can be used, namely:

a) pad disperse dyes, Thermosol develop, pad vat dyes, jig develop, or

b) pad disperse and vat dyes together, Thermosol develop, then jig develop vat dyes.

2) *Direct Dyes.* Where rayon is the cellulosic fiber in the blend, many dyers will use direct dyes, especially if the fabric is to be resin aftertreated. Although direct dyes are inferior in fastness to vat dyes, they will meet many commercial requirements. Conventional methods are employed for their application.

Developed dyes can be applied to the rayon to produce dyeings having acceptable fastness to washing, but their fastness to light is generally inadequate for use on these blends.

FINISHING

Proper finishing techniques must be employed to impart optimum properties to dyed fabrics containing man-made fibers. Through the use of heat, mechanical work, and chemicals, the finisher can provide many desirable aesthetic qualities and excellent "wash-wear" performance in the fabric. For instance, Dacron, being thermoplastic, can relax, swell, and shrink. Treatments can be varied to achieve such fabric qualities as dimensional stability, crease retention, reduced pilling, embossed surfaces, permanent pleats, and improvements in handle, drape, and resilience.

Let us review some of these treatments and their use in finishing fabrics made of blends of Dacron and cellulose fibers.

Probably the most effective combination of treatments to control pilling is in the use of heat-setting and singeing. At elevated temperatures of 385 to 420°F for 60 to 90 seconds, Dacron Type 54 becomes plastic, shrinks and releases the strains set up during yarn and fabric processing. When cooled, the fibers become set and locked within the yarn and fabric structure. This setting is permanent provided the temperature used is not exceeded in subsequent handling. In addition to increased pilling protection, improvement in dimensional stability is also achieved. Heat treatment improves handle, drape, resilience, and "wash-wear" performance. When ortho-phenylphenol carriers are used in dyeing, treatment for one minute at a minimum of 380°F removes residual car-

rier and greatly improves fastness to light. It is also important when heat-setting after dyeing that dyes selected should be those that exhibit minimum vaporization. Because of the inherent resistance to pilling of fabrics of Dacron Type 64, temperatures above 350°F are unnecessary. Reduced wrinkle resistance and recovery have been noticed where this temperature is increased.

Singeing is, without a doubt, the most important single step which can be used for the control of pilling. (Fabrics containing pill-resistant Dacron Type 64 do not require singeing to achieve commercially acceptable pill resistance, but singeing may be used to alter the fabric hand.) Better hand can be obtained in heavyweight fabrics if brushing and shearing precede the singeing. To achieve good pill resistance, a deep, thorough, evenly applied singe, preferably two flame exposures, at the slowest possible speed is necessary. Apparently, the flame melts the fuzz back, giving to the fabric a smooth surface. It is important that the singer be maintained in top operating condition to avoid fused and dirt-spotted goods.

Schreiner or plain calendering improves cover, uniformity, and luster. Excessive calendering can lower the wash-wear rating by restricting yarn mobility and flexibility within the fabric.

Pressing and semidecating alter the hand and luster of suiting-weight fabrics.

A compressive shrinkage operation, such as the Rigmel process or Sanforized treatment is necessary to make the cotton components dimensionally stable to washing.

The heat-caustic finishing technique on Dacron Type 54 uses fabric shrinkage to effect an exaggerated yarn-weave crimp.[3] The fabric is heat-set at elevated temperatures and then treated with a dilute solution of caustic soda, which reduces the diameter of the Dacron. This permits greater freedom of yarn movement and allows spring-like action of the weave crimp to come into use. Calendering prior to the heat-caustic step gives the fabric a crisper hand. This process is not applicable to dyed yarns because of possible shade changes.

When resins are applied to fabrics of Dacron and cellulose fibers, modifications in hand and improved crease resistance are noted. Because of the pronounced swelling of rayon, when wet, resins must be applied to suiting-weight fabrics of Dacron and rayon to insure stability. Resins do not have any appreciable effect on the Dacron. Application of resins is similar to that on all-cellulosic fabrics and consists of padding, predrying, curing, and neutralizing. In the final drying step the fabric should be relaxed completely.

Du Pont's recently announced Zeset MC fabric stabilizer is particularly recommended since it imparts durable crease resistance and dimensional stability. When used with Zeset MC, a nonionic durable softener, such as Avitex K, improves the wash-wear performance and the tear strength properties, Avitex Q produces a soft, lubricated hand, and polyvinyl alcohol in small amounts stiffens the hand.

Water repellents, such as Zelan FF and AP Paste, have durable qualities when applied to Dacron as well as to the cellulosic component of the blend. Large-scale tests have shown that this treatment will last the life of most rainwear garments. While such treatment makes both fiber components resistant to water, the fabric must be properly constructed to resist the driving penetration forces of rain.

Softeners and thickeners supply a variety of psychological responses and functions to the consumer and cutter. They can provide a feeling of in the fabrication of garments. They limpness or smoothness, and can aid must be easy to apply, be compatible with resins, starches, and gums. They must have no adverse effects on the dyed shade or on the fastness to light, crocking, and washing. Most softeners can be applied in the last rinse after dyeing or can be padded on the finish mangle prior to drying. High alkyl amine cationic softeners, such as Avitex R, give a soft, dry hand desired in shirting and dress goods. Methacrol Lubricant K imparts additional surface lubrication when used 1:1 with Avitex R. If a stiffer hand is desired, it could be used with a small amount of polyvinyl alcohol. Avitex K, a nonionic-type softener, aids in high-speed sewing and cutting operations by minimizing friction and heat generation which might cause fusing and scorching.

SUMMARY

In the preparation of blends of Dacron Type 54 and cotton for dyeing, the gray singe and kier boil commonly used in all-cotton preparation are omitted and the fabric is set or crabbed in the open width; otherwise, preparation is similar to that for cotton fabrics. Blends of either Dacron Type 54 or Type 64 and rayon are also set before dyeing.

When disperse dyes are to be applied to the Dacron in blended yarn, the high-temperature method is especially suitable, although dyeing at 208°F with a carrier is also employed. Vat dyes are particularly recommended for production of optimum fastness on the cellulose fiber. Carrier methods are generally used for dyeing the Dacron in fabrics, but it is expected that increased yardages will lead to greater use of the Thermosol Process. There are many factors to be considered in selecting disperse dyes to produce various shades. Vat dyes can be applied to the cellulose component by either pad-steam or pad-jig methods. Cationic dyes are applicable to Dacron Type 64 to produce bright shades on ladies' wear, as well as economical black and navy shades. The aesthetic properties, as well as the wash-wear performance, are influenced by the finishing techniques to which these blend fabrics are subjected.

LITERATURE REFERENCE

(1) Iannarone, J J; Speakman, P L; Larson, O S; Hurt, R C; and Hinton, E H: *Am Dyestuff Reptr* **46**, P674 (1957).

ACKNOWLEDGMENT

The suggestions of A R Taylor on preparation and finishing procedures, Oleta S Larson on procedures for dyeing blends containing Dacron Type 54, Blanche S Peterson on procedures for dyeing Dacron Type 64 and on the selection of disperse and cationic dyes, G R Turner on the selection of disperse dyes, and G A Slowinske on finishing procedures were utilized in the preparation of this paper. The authors gratefully appreciate their assistance.

TRADEMARKS

The following are registered trademarks of E I du Pont de Nemours & Co, Inc:

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Sanforized—Cluett, Peabody & Co
Tensitrol—Rodney Hunt Machine Co
Varsol—Esso Standard Oil Co

[3] The caustic treatment of polyethylene terephthalate fabrics was first disclosed by John D Hall in U S 2,590,402. Insofar as this process is dominated by that patent, it is available to the public through an agreement between the Du Pont Company and ICI, which owns the patent.

COLOUR INDEX
Additions and Amendments
Number 3*

IN conformity with the policy stated in the preamble to the *Colour Index*, it is intended to publish quarterly in issues of *American Dyestuff Reporter* and the *Journal of the Society of Dyers and Colourists* a list of additions and amendments to the Second Edition of the *Colour Index* which have been reported to the American Association of Textile Chemists and Colorists or the Society of Dyers and Colourists during the previous three months.

Copies of these lists printed on one side of the paper only probably will be made available. For further details apply to AATCC National Headquarters, P O Box 28, Lowell, Mass.

*The first list was published in the November 3, 1958 issue of *American Dyestuff Reporter*, page P776; the second list in the January 26, 1959 issue.

VOLUME 1

Additional *Colour Index* Designations and Numbers

Page 1052	CI 14007	Monoazo (metallized)	CI Acid Yellow 120
			Hue Yellow Chromolan Yellow G ..... Chem
Page 1374	CI 20175	Disazo	CI Acid Brown 213
			Coriamine Brown B2C ..... Pol
	CI 34907	Trisazo	CI Acid Brown 214
			Coriamine Brown RT ..... Pol
Page 1404	CI 65008	Anthraquinone	CI Acid Black 97
			Hue Greenish Grey Alizarine Acid Grey GG .... Chem
Page 1431	CI 14058	Monoazo	CI Mordant Yellow 60
			Acid Chrome Yellow 2GN ... Pol
Page 1549	CI 18092	Monoazo	CI Mordant Green 52
			Acid Chrome Green G ..... Pol
Page 1584	CI 20151	Disazo	CI Mordant Brown 90
			Hue Brown Alizarine Chrome Brown G Chem
Page 1675	Diphenylamine		CI Disperse Yellow 40
			Hue Yellow Serisol Fast Yellow GGL ... YDC
	Diphenylamine		CI Disperse Yellow 41
			Hue Yellow Serisol Fast Yellow YGL ... YDC

Amendments

Page	*Colour Index Designation*		
1005	CI Acid Yellow 5	*add*	Quinoline Yellow KT ICI
1010	CI Acid Yellow 17	*add*	Naphthazine Light Yellow 2G ... BEL
		add	Neran Brilliant Yellow 2G ICI
1016	CI Acid Yellow 29	*add*	Propolan Yellow 3G, 3GX ICI
1021	CI Acid Yellow 40	*delete*	Calcocid Milling Yellow 3G CCC
	under "The following brands are similar"	*add*	Calcocid Milling Yellow 3G CCC
1022	CI Acid Yellow 42	*add*	Naphthalene Leather Yellow 2G .. ICI
1027	CI Acid Yellow 54	*add*	Chromolan Yellow ELN ..... Chem
		add	Ultralan Yellow G ICI
1030	CI Acid Yellow 61	*add*	Sulphonol Fast Yellow P ..... YDC
1035	CI Acid Yellow 73	*delete*	Calcocid Uranine SM CCC
		add	Fluoresceine LT ICI
		add	Fluoresceine S (free acid) ICI
1039	CI Acid Yellow 85	*add*	Naphthalene Leather Yellow 5G .. ICI
1044	CI Acid Yellow 99	*add*	Chromolan Yellow GRK ..... Chem
1056	CI Acid Orange 7	*delete*	Calcocid Orange AD CCC
1064	CI Acid Orange 24	*delete*	Calcocid Brown YR CCC
1066	CI Acid Orange 28	*add*	Sulphonol Fast Orange PO ..... YDC
1078	CI Acid Orange 56	*delete*	Calcocid Milling Orange G CCC
1083	CI Acid Orange 72	for	Tertroxane Orange R ..... CT
		read	Tertroxane Orange RN ..... CT
1084	CI Acid Orange 74	*add*	Chromolan Orange G ..... Chem

Page	*Colour Index Designation*		
			Tertracid Green Black B ..... CT

Page	Colour Index Designation			
1085	CI Acid Orange 76	*delete*	Calcofast Wool Orange 2R	CCC
1086	CI Acid Orange 79	*add*	Tertracid Milling Orange SRR	CT
1096	CI Acid Red 12	*delete*	Calcochrome Blue F4B	CCC
1097	CI Acid Red 14	*add*	Tertrochrome Blue FB	CT
1101	CI Acid Red 25	*delete*	Calcocid Scarlet 4RN	CCC
		delete	Scarlet 4RN	CCC
1102	CI Acid Red 26	*delete*	Scarlet 2RB	CCC
1103	CI Acid Red 27	*delete*	Amaranth	CCC
		delete	Calcocid Amaranth	CCC
1109	CI Acid Red 40	*delete*	Calcocid Ceresine	CCC
		delete	Serisine B (See A&A p 4556)	CCC
		delete	Seresine B	CCC
1117	CI Acid Red 57	*add*	Kiton Fast Red 3GP	CAC
1129	CI Acid Red 87	*delete*	D&C Red No. 22	CCC
		delete	Eosine BP	CCC
1130	CI Acid Red 88	*delete*	Calcocid Fast Red S	CCC
1132	CI Acid Red 92	*delete*	Calcocid Phloxine BN, JN	CCC
		delete	Phloxine JN	CCC
1133	CI Acid Red 94	*delete*	Calcocid Rose Bengale	CCC
1141	CI Acid Red 114	*add*	Midlon Red PRS	Chem
1149	CI Acid Red 129	*add*	Carbolan Rubine 2B	ICI
1151	CI Acid Red 134	*delete*	Calcocid Milling Red BC	CCC
		add	Coomassie Bordeaux B	ICI
1158	CI Acid Red 152	*add*	Tertracid Milling Red A5BL	CT
1160	CI Acid Red 158	*add*	Coomassie Red BR	ICI
1167	CI Acid Red 179	*add*	Chromolan Bordeaux R	Chem
1168	CI Acid Red 180	*delete*	Calcofast Wool Red RN	CCC
1169	CI Acid Red 183	*delete*	Calcofast Wool Red GA	CCC
		add	Chromolan Red GRE	Chem
1171	CI Acid Red 186	*add*	Chromolan Pink B	Chem
1181	CI Acid Red 214	*add*	Chromolan Red BEN	Chem
1193	CI Acid Violet 5	*add*	Tertracid Brilliant Red 10B	CT
1207	CI Acid Violet 34	for *read*	Calcocid Alizarine Violet NC	CCC
			Calcocid Alizarine Violet RNC	CCC
1214	CI Acid Violet 49	*add*	Tertracid Brilliant Violet 6B	CT
1217	CI Acid Violet 56	*add*	Chromolan Violet 3R	Chem
1218	CI Acid Violet 58	*delete*	Calcofast Wool Violet 6R	CCC
1229	CI Acid Blue 1	*delete*	Calcocid Blue VS	CCC
1232	CI Acid Blue 7	*add*	Disulphine Blue AN	ICI
		add	Disulphine Lake Blue AN	ICI
1236	CI Acid Blue 15	*add*	Tertracid Milling Brilliant Blue B	CT
1239	CI Acid Blue 22	*add*	Calcocid Ink Blue R	CCC
		add	Ink Blue A	ICI
		add	Soluble Paper Blue W	ICI
1249	CI Acid Blue 45	*delete*	Calcocid Alizarine Blue SAPX	CCC
1271	CI Acid Blue 93	*delete*	Calcocid Ink Blue R	CCC
1283	CI Acid Blue 120	*delete*	Calcocid Navy Blue R	CCC
1297	CI Acid Blue 154	*add*	Chromolan Blue RR	Chem
1299	CI Acid Blue 158	*add*	Chromolan Blue GG	Chem

Page	Colour Index Designation			
1316	CI Acid Green 20	*add*	Tertracid Green Black B	CT
1334	CI Acid Brown 14	*add*	Naphthalene Leather Brown AD	ICI
1335	CI Acid Brown 17	*add*	Tertracid Milling Brown AR	CT
		add	Tertrochrome Brown AR	CT
1339	CI Acid Brown 27	*add*	Carbolan Brown BL	ICI
1375	CI Acid Black 1	*delete*	Calcocid Blue Black 10BP	CCC
1376	CI Acid Black 2	*add*	Nigrosine HN	ICI
1384	CI Acid Black 24	*add*	Tertracid Fast Black 2B	CT
1391	CI Acid Black 43	*add*	Chromolan Black RR	Chem
1395	CI Acid Black 52	*add*	Chromolan Black WA	Chem
		add	Ultralan Leather Black RN	ICI
1411	CI Mordant Yellow 10	*add*	Tertrochrome Yellow R	CT
1412	CI Mordant Yellow 12	*add*	Metachrome Yellow MYS	BEL
1413	CI Mordant Yellow 14	*delete*	Calcochrome Yellow 3G	CCC
1433	CI Mordant Orange 1	*add*	Metachrome Orange R	BEL
1464	CI Mordant Red 27	*add*	Solochrome Brilliant Red 3B	ICI
1471	CI Mordant Red 48	*add*	Chromazol Red G	ICI
1478	CI Mordant Red 71	*add*	Tertrochrome Bordeaux AB	CT
1481	CI Mordant Violet 1	*add*	Solochrome Brilliant Violet R	ICI
1504	CI Mordant Blue 3	*add*	Tertrochrome Cyanine CR	CT
1520	CI Mordant Blue 42	*add*	Tertrochrome Blue CR	CT
1527	CI Mordant Blue 60	*add*	Chromazol Brilliant Blue 4G	ICI
1541	CI Mordant Green 26	*add*	Solochromate Fast Olive B	ICI
1551	CI Mordant Brown 1	*delete*	Calcochrome Brown EBL	CCC
		add	Metachrome Brown EB	BEL
1552	CI Mordant Brown 4	*add*	Metachrome Brown BR	BEL
1555	CI Mordant Brown 12	*add*	Metachrome Brown R	BEL
1558	for CI 20150 Monoazo	*read*	CI 20150 Disazo	
1561	CI Mordant Brown 24	*add*	Metachrome Brown 6G	BEL
1565	CI Mordant Brown 33	*add*	Tertrochrome Brown RH	CT
1571	CI Mordant Brown 48	*add*	Metachrome Brown B	BEL
1578	CI Mordant Brown 66	*add*	Metachrome Olive 2G	BEL
1579	CI Mordant Brown 70	*delete*	Calcochrome Brown ROC	CCC
1585	CI Mordant Black 1	for *read*	Tertrochrome Black A	CT
			Tertrochrome Black GA	CT
1588	CI Mordant Black 7	*add*	Tertrochrome Black PBB	CT
1591	CI Mordant Black 13	*delete*	Calcochrome Alizarine Blue Black 3B	CCC
1619	CI Basic Yellow 1	*delete*	Calcozine Flavine TG	CCC
	CI Basic Yellow 2	*add*	Auramine O	ICI
1623	CI Basic Orange 2	*add*	Chrysoidine YN	ICI
1625	CI Basic Orange 10	*delete*	Calcozine Phosphine 3B	CCC
1627	CI Basic Orange 16	*delete*	Calcozine Phosphine 2RNC	CCC
1629	CI Basic Red 1	*add*	Rhodamine 6GBN	ICI
1633	CI Basic Violet 1	*add*	Methyl Paper Violet 2BN	ICI
1634	CI Basic Violet 3	*add*	Methyl Violet 10BO	ICI
1636	CI Basic Violet 10	*add*	Rhodamine BN	ICI

	Hue Brown		
	Alizarine Chrome Brown G		Chem

1084	CI Acid Orange 74	*add*	Tertroxane Orange R	CT
			Tertroxane Orange RN	CT
			Chromolan Orange G	Chem

1637	CI Basic Violet 14	*add*	Magenta Large Crystals	ICI
		add	Magenta P	ICI
1639	CI Basic Blue 1	*add*	Acronol Brilliant Blue 6G	ICI
1641	CI Basic Blue 7	*add*	Victoria Pure Blue BO	ICI
1642	CI Basic Blue 9	*delete*	Ext D&C Blue No. 1	CCC
		add	Methylene Blue 2BN	ICI
1647	CI Basic Green 1	*add*	Brilliant Green YN	ICI
1648	CI Basic Green 4	*add*	Malachite Green CB	ICI
1650	CI Basic Brown 4	*add*	Bismarck Brown FR	ICI
1659	CI Disperse Yellow 1	*add*	Dispersol Printing Yellow A	ICI
1660	CI Disperse Yellow 3	*add*	Serinyl Hosiery Yellow GD	YDC
1669	CI Disperse Yellow 27	*add*	Serisol Fast Yellow GWD	YDC
1672	CI Disperse Yellow 34	*add*	Serisol Fast Yellow 4RGL	YDC
1677	CI Disperse Orange 1	*add*	Dispersol Printing Orange A	ICI
1678	CI Disperse Orange 3			
		delete	Calcosyn Orange 2RN	CCC
		add	Serilan Orange GXD	YDC
1683	CI Disperse Orange 13	*add*	Serilene Orange BL	YDC
1687	CI Disperse Red 1	*add*	Serinyl Hosiery Scarlet BD	YDC
1689	CI Disperse Red 5	*add*	Serisol Fast Rubine BD	YDC
1692	CI Disperse Red 11	*add*	Duranol Printing Red X3B	ICI
1696	CI Disperse Red 19	*add*	Serinyl Hosiery Scarlet GD	YDC
1697	CI Disperse Red 22	*add*	Serisol Fast Pink RGL	YDC
1700	CI Disperse Red 31	*delete*	Calcosyn Scarlet GC	CCC
1702	CI Disperse Red 35	*add*	Serisol Fast Red NGGL	YDC
1705	CI Disperse Violet 1	*delete*	Calcosyn Red Violet R	CCC
1706	CI Disperse Violet 4	*delete*	Calcosyn Violet B	CCC
1713	CI Disperse Blue 1	*delete*	Calcosyn Blue 2BG	CCC
		add	Serinyl Blue 3G	YDC
1714	CI Disperse Blue 3	*add*	Duranol Printing Blue B	ICI
		add	Serinyl Hosiery Blue BG	YDC
		add	Serisol Brilliant Blue BP	YDC
		delete	Calcosyn Sapphire Blue 2GS	CCC
		delete	Calcosyn Sapphire Blue R	CCC
	under "The following brands are similar"	*add*	Calcosyn Sapphire Blue 2GS	CCC
		add	Calcosyn Sapphire Blue R	CCC
1716	CI Disperse Blue 7	*add*	Duranol Printing Blue Green B	ICI
1718	CI Disperse Blue 11	*add*	Serisol Diazo Navy Blue RD	YDC
1725	CI Disperse Blue 26	*add*	Duranol Printing Blue G	ICI
		add	Serilene Blue GL, 2GL	YDC
1727	CI Disperse Blue 33 under "The following brand is similar"	*delete*	Calcosyn Discharge Blue BN	CCC
1728	CI Disperse Blue 35	*delete*	Serisol Dark Blue B	YDC
		add	Duranol Dark Blue T	ICI
		add	Serilene Dark Blue G	YDC
1735	CI Disperse Black 2	*add*	Dispersol Diazo Black 2BN	ICI
1738	CI Disperse Black 9	*delete*	Calcosyn Diazo Black GHS	CCC
		add	Serisol Diazo Black 3G	YDC
1791	CI Food Blue 3	*add*	Edicol Supra Blue VR	ICI

VOLUME 2

Additional *Colour Index* Designations and Numbers

Page			
2168	CI 29232	Disazo	CI Direct Violet 87
			Helion Violet 3BL ..... Pol
	CI 22046	Disazo	CI Direct Violet 88
			Cresotine Dark Violet ..... Pol
Page			
2236	CI 31951	Trisazo	CI Direct Blue 183
			Diazo Blue 2B ..... Pol
	CI 29128	Disazo	CI Direct Blue 184
			Helion Blue 3RL ..... Pol
	CI 29130	Disazo	CI Direct Blue 185
			Helion Navy Blue GL ..... Pol
Page			
2236	CI 34139	Trisazo	CI Direct Blue 186
			Hue Reddish Navy Saturn Blue LRR ..... Chem
	CI 34146	Trisazo	CI Direct Blue 187
			Helion Blue RL ..... Pol
Page			
2359	CI 35415	Polyazo	CI Direct Black 100
			Cresotine Grey B ..... Pol
	CI 34100	Trisazo	CI Direct Black 101
			Helion Grey BL ..... Pol
Page			
2412	CI 53218		CI Sulphur Brown 62
			Hue Brownish Olive → Yellowish Brown Sulfogen Black Brown 2N .. Chem
Page			
2517	CI 59856	Anthraquinone	CI Vat Blue 51
			Helanthrene Navy Blue LK ... Pol

Page	*Colour Index Designation*		
			Textradirect Light Brown 3R ..... CT

		add	Serisol Diazo Black 3G ..... YDC
1791	CI Food Blue 3	*add*	Edicol Supra Blue VR ICI

			Helanthrene Navy Blue LK ... Pol

Page		
2530	CI 73685 Indigoid	CI Vat Green 25
		Hue Green
		Cibanone Green GC ... CAC, Ciba

Page		
2666		CI Azoic Blue 27
		Hue Greenish Navy
		Citazene Blue CR ..... Acna

Page		
2678		CI Azoic Black 8
	For Polyester fiber	Hue Greenish Black
		Serilene Azoic Black B2 ... YDC

Page		
2724	CI 12470 Monoazo	CI Pigment Orange 22
		Hue Reddish Orange
		Versal Orange GR ..... Chem

Page		
2832		CI Solvent Yellow 52
		Hue Reddish Yellow
		Seriplas Yellow A ..... YDC

Page		
2842		CI Solvent Orange 35
		Hue Bright Orange
		Seriplas Orange YL ..... YDC

Amendments

Page	*Colour Index Designation*		
2005	CI Direct Yellow 6	*add*	Chlorazol Paper Yellow FG ... ICI
2007	CI Direct Yellow 9	*add*	Chlorazol Yellow DP ICI
2008	CI Direct Yellow 11	*add*	Chlorazol Paper Yellow R ICI
2009	CI Direct Yellow 12	*delete*	Chrysophenine ESN CCC
		add	Tertrodirect Yellow CG ..... CT
2015	CI Direct Yellow 28	*add*	Tertrodirect Fast Yellow FRL ... CT
2016	CI Direct Yellow 29	*add*	Tetrodirect Fast Yellow RT ... CT
		delete	CI Direct Yellow 30
2034	CI Direct Yellow 72	*add*	Icin Soga Koening RN ICI
2037	CI Direct Orange 1	*add*	Tertrodirect Orange PG ..... CT
2044	CI Direct Orange 18	*add*	Chlorazol Orange Brown RNP ... ICI
2052	CI Direct Orange 40	*delete*	Tertrodirect Light Brown 2R ... CT
		add	Diazine Fast Brown YRL ..... BEL
		add	Durazol Orange Brown GP ICI
2063	CI Direct Orange 73	*delete*	Calcoform Yellow RXD CCC
		add	Chlorazol Diazo Orange 2G ICI
2079	CI Direct Red 10	*delete*	Calcomine Garnet B CCC
2080	CI Direct Red 13	*delete*	Calcomine Bordeaux 6BN CCC
2081	CI Direct Red 16	*delete*	Pheno Red 6BX CCC
2082	CI Direct Red 20	*delete*	Calcomine Pink RX CCC
		delete	Pheno Pink RX CCC
2083	CI Direct Red 23	*add*	Chlorazol Fast Scarlet 4BSP ICI
2087	CI Direct Red 31	for	Tertrodirect Pink RD ..... CT
		read	Tertrodirect Pink DR ..... CT
		delete	Calcomine Red 12B CCC
2092	CI Direct Red 45	*delete*	Calcomine Brilliant Pink SX ... CCC
2097	CI Direct Red 61	*add*	Tertrodirect Brilliant Purpurine 10B ..... CT
2103	CI Direct Red 80	*add*	Tertrodirect Fast Red F3B ..... CT
2105	CI Direct Red 84	*add*	Tertrodirect Fast Brown 3RL ..... CT
2108	CI Direct Red 94	*delete*	Calcodur Brown 4RL CCC
2110	CI Direct Red 99	for	Disazo (metallised)
		read	CI 29167 Disazo (metallised)
		add	Helion Bordeaux BL ..... Pol
		add	Saturn Bordeaux LB ..... Chem
2114	CI Direct Red 111	*add*	Tertrodirect Fast Brown 4RD ... CT
2116	CI Direct Red 116	*add*	Tertrodirect Fast Brown 2R ..... CT
2118	CI Direct Red 121	*add*	Tertrodiazo Bordeaux FBL ..... CT
2119	CI Direct Red 123	*add*	Tertrodiazo Brilliant Scarlet ROA CT
2130	CI Direct Red 154	*add*	Tertrodiazo Red 8BL ..... CT
2145	CI Direct Violet 7	*add*	Chlorazol Fast Helio 2RKP ICI
2148	CI Direct Violet 14	*delete*	Calcomine Brilliant Rubine B ... CCC
2150	CI Direct Violet 22	*delete*	Calcomine Violet B CCC
		delete	Pheno Violet B CCC
2156	CI Direct Violet 46	for	Monoazo (metallised)
		read	CI 17515 Monoazo (metallised)
		delete	Oxanal Violet RLL ..... Ciba
		add	Direct Supra Light Violet MRL ..ICS See the instructions for CI Direct Violet 55
		add	Saturn Violet LRL ..... Chem
2159		*delete*	CI Direct Violet 55 Transfer the dye and information to CI Direct Violet 46
2163	CI Direct Violet 67	*delete*	Calcoform Violet BD CCC
2170	CI Direct Blue 2	*delete*	Calcomine Diazo Black BHDG ... CCC
		delete	Pheno Navy Blue B CCC
2179	CI Direct Blue 22	*delete*	Calcomine Blue RW CCC
2181	CI Direct Blue 26	for	Calcomine Dark Blue B CCC
		read	Calcomine Dark Blue BN CCC
2193	CI Direct Blue 67	*delete*	Calcodur Blue RL CCC

Page	Colour Index Designation			
2196	CI Direct Blue 74	*add*	Durazol Burl Blue 3R	ICI
2198	CI Direct Blue 78	*add*	Tertrodirect Fast Blue SG	CT
2200	CI Direct Blue 84	*add*	Tertrodirect Fast Blue SGL	CT
2201	CI Direct Blue 86	*add*	Tertrodirect Fast Turquoise GL	CT
	CI Direct Blue 87	*add*	Durazol Blue 6GW	ICI
		add	Durazol Printing Blue 6G	ICI
2204	CI Direct Blue 96	*add*	Tertrodirect Fast Blue 7GL	CT
2208	CI Direct Blue 106	*add*	Durazol Sky Blue G	ICI
		add	Durazol Sky Blue GP	ICI
2209	CI Direct Blue 109	*add*	Durazol Brilliant Blue B	ICI
		add	Durazol Brilliant Blue BP	ICI
2213	CI Direct Blue 120	*add*	Tertrodiazo Indigo Blue BR	CT
	CI Direct Blue 120 or 120A	*delete*	Calcomine Diazo Blue BD	CCC
	CI Direct Blue 121	*add*	Tertrodiazo Indigo Blue RM	CT
2215	CI Direct Blue 126	*add*	Tertrodiazo Blue 2R	CT
2218	CI Direct Blue 135	*add*	Tertrodiazo Indigo Blue 3RL	CT
2223	CI Direct Blue 148	*add*	Tertrodirect Fast Copper Blue GL	CT
2239	CI Direct Green 6	*add*	Chlorazol Paper Green BN	ICI
2240	CI Direct Green 8	*delete*	Calcomine Green SL	CCC
2241	CI Direct Green 12	*delete*	Calcomine Green BT	CCC
2247	CI Direct Green 26	*add*	Durazol Green BL	ICI
	CI Direct Green 27	*add*	Durazol Green 5B	ICI
2250	CI Direct Green 34	*add*	Durazol Green D	ICI
2256	CI Direct Green 47	*delete*	Calcoform Green BLD	CCC
2264	CI Direct Brown 2	*add*	Chlorazol Brown MP	ICI
2272	CI Direct Brown 25	*delete*	Calcomine Catechu GN	CCC
2273	CI Direct Brown 27	for *read*	Tertrodirect Brown CBO Tertrodirect Brown CB	CT CT
	CI Direct Brown 28	*delete*	Calcomine Chrome Brown BS	CCC
2275	CI Direct Brown 31	*add*	Direct Brown FS	Chem
2276	CI Direct Brown 33	*delete*	Calcomine Catechu LB	CCC
2283	CI Direct Brown 52	*add*	Tetrodirect Bronze G	CT
2292	CI Direct Brown 79	*add*	Direct Brown 3GN	Chem
2295	CI Direct Brown 95 under "The following brands are similar"	*add* *add*	Diazine Fast Brown RSL Diazine Fast Brown GL	BEL BEL
2313	CI Direct Brown 153	*add*	Azogen Brown R	Chem
2326	CI Direct Black 4	*delete*	Calcomine Black R	CCC
2332	CI Direct Black 19	*add*	Tertrodirect Black V	CT
2335	CI Direct Black 28	*delete*	Tertrodirect Black V	CT
2338	CI Direct Black 38	*delete*	Calcomine Black G	CCC
		add	Calcomine Black EXL	CCC
2339		*add*	Chlorazol Leather Black ENP	ICI
2349	CI Direct Black 71	*add*	Tertrodirect Fast Grey VGL	CT
2353	CI Direct Black 80	*add*	Tertrodiazo Black OB	CT
2363	CI Sulphur Yellow 2 under "Applied by method 1"	*add* *add*	Sulfogen Yellow R Tertrosulphur Yellow 2G	Chem CT
2364	CI Sulphur Yellow 4 under "Applied by method 1"	*add*	Tertrosulphur Yellow 6G	CT
2366	CI Sulphur Yellow 9	*add*	Sulfogen Yellow G	Chem
2369	CI Sulphur Orange 1 under "Applied by method 1"	*add* *add*	Sulfogen Brown RS Tertrosulphur Orange CN	Chem CT
2370	CI Sulphur Orange 3 under "Applied by method 1"	*add* *add*	Sulfogen Orange RK Tertrosulphur Orange TR	Chem CT
2373	CI Sulphur Red 6 under "Applied by method 1"	*delete* *add*	Calcogene Violet Brown CF Conc Sulfogen Red Brown BK	CCC Chem
2376	CI Sulphur Violet 4 under "Applied by method 1"	*delete* *add*	Calcogene Claret G Sulfogen Purple C	CCC Chem
2378	CI Sulphur Blue 3	*add*	Sulfogen Blue 6B	Chem
2379	CI Sulphur Blue 5 under "Applied by method 1"	*add*	Tertrosulphur Direct Blue B, VBR	CT
2381	CI Sulphur Blue 10 under "Applied by method 1"	*add*	Sulfogen Blue FBL	Chem
2382	CI Sulphur Blue 11 under "Applied by method 1"	*add* *add*	Sulfogen Blue 2RL Tertrosulphur Direct Blue RL	Chem CT
2384	CI Sulphur Blue 15 under "Applied by method 1"	*add* *add*	Sulfogen Green B Sulfogen Green Blue CV	Chem Chem
2385	CI Sulphur Green 2 under "Applied by method 1"	*delete* *add*	Calcogene Green YS-CF Tertrosulphur Green B	CCC CT
2386	CI Sulphur Green 3 under "Applied by method 1"	*add*	Sulfogen Green 3G	Chem
2396	CI Sulphur Brown 10 under "Applied by method 1"	*delete* *add*	Calcogene Tan Y-CF extra conc Tertrosulphur Cutch MG	CCC CT
2397	CI Sulphur Brown 12 under "Applied by method 1"	*add*	Tertrosulphur Bordeaux B	CT

Page	Colour Index Designation			
	under "Applied by method 1"	*add*	Sulfogen Yellow R	Chem
		add	Tertrosulphur Yellow 2G	CT
2397	CI Sulphur Brown 12 under "Applied by method 1"	*add*	Tertrosulphur Bordeaux B	CT

Page	Colour Index Designation			
2398	CI Sulphur Brown 14 under "Applied by method 1"	*delete*	Calcogene Dark Brown CN-CF	CCC
2413	CI Sulphur Black 1 under "Applied by method 1"	*add*	Sulfogen Black BWLE	Chem
2427	CI Vat Yellow 1	*delete*	Calcosol Yellow G	CCC
2439	CI Vat Yellow 26	*add*	Caledon Printing Yellow 5GKN	ICI
2447	CI Vat Orange 5	*delete*	Calcoloid Orange RD	CCC
		add	Durindone Orange RP	ICI
2452	CI Vat Orange 15	for	Calcosol Golden Orange 3G	CCC
		read	Calcoloid Golden Orange 3G	CCC
2461	CI Vat Red 11	*add*	Durindone Pink 2BP	ICI
2462	CI Vat Red 13	*delete*	Calcosol Red 2B	CCC
2465	CI Vat Red 21	*add*	Caledon Red 4B	ICI
2469	CI Vat Red 31	*add*	Caledon Brilliant Red 5B	ICI
2471	CI Vat Red 37	*add*	Caledon Printing Scarlet G	ICI
		add	Caledon Scarlet G	ICI
2473	CI Vat Red 41	*add*	Durindone Red BP	ICI
2475	CI Vat Red 45	*add*	Durindone Scarlet YP	ICI
2479	CI Vat Violet 1	*add*	Calcoloid Violet 4RD	CCC
2480	CI Vat Violet 2	*delete*	Calcosol Violet 6RD	CCC
		add	Calcoloid Violet 6RD	CCC
		add	Durindone Red 3BP	ICI
2481	CI Vat Violet 3	*add*	Durindone Magenta BP	ICI
2485	CI Vat Violet 9	*add*	Calèdon Printing Violet 3B	ICI
2488	CI Vat Violet 15	*add*	Caledon Brilliant Violet 2B	ICI
2491	CI Vat Blue 1	*add*	Indigo ND	ICI
		add	Vulcafor Blue A	ICI
		add	Vynamon Blue A	ICI
2494	CI Vat Blue 4	for	Calcosol Blue RS	CCC
		read	Calcoloid Blue RS	CCC
2495	CI Vat Blue 5	*delete*	Calcosol Blue 2BDG	CCC
		add	Durindone Blue 4BCP	ICI
2496	CI Vat Blue 6	*delete*	Calcoloid Blue BLN, BLNS	CCC
		for	Calcosol Blue BLD	CCC
		read	Calcoloid Blue BLD	CCC
		add	Calcoloid Blue BLC	CCC
2496	CI Solubilised Vat Blue 6	*add*	Soledon Blue 2RCX	ICI
2497	CI Vat Blue 7	*add*	Caledon Printing Green 6B	ICI
2501	CI Vat Blue 14	*delete*	Calcosol Blue GCD, GCP	CCC
		add	Calcoloid Blue GCD	CCC
2503	CI Vat Blue 18	*add*	Caledon Navy Blue ART	ICI
2504	CI Vat Blue 20	*delete*	Monolite Blue 3R	ICI
		add	Calcoloid Dark Blue BRD	CCC
2510	CI Vat Blue 35	*delete*	Calcosol Blue RP	CCC
2521	CI Vat Green 3	for	Cibanone Olive 2B(F)	CAC, Ciba
		read	Cibanone Olive FB	CAC, Ciba
2522	CI Vat Green 4	*add*	Caledon Jade Green BW	ICI
2524	CI Vat Green 8	*delete*	Calcosol Khaki G	CCC
2525	CI Vat Green 9	*delete*	Calcosol Black BB	CCC
2531	CI Vat Brown 1	*delete*	Calcosol Brown BR	CCC
2532	CI Vat Brown 3	*delete*	Calcosol Brown R, RN	CCC
		add	Calcoloid Brown RNB	CCC
2533	CI Vat Brown 5	for	Calcoloid Brown RRP	CCC
		read	Calcoloid Brown RRWP	CCC
		add	Durindone Brown GP	ICI
2551	CI Vat Black 1	*add*	Durindone Printing Black BL	ICI
2557	CI Vat Black 16	*add*	Helanthrene Grey 3B	Pol
2559	CI Vat Black 22	*delete*	Calcosol Grey 2G, 2GP	CCC
		add	Calcoloid Grey 2GN, 2GP, 2GC	CCC
2560	CI Vat Black 25	*delete*	Calcosol Olive T, TCC, TRR	CCC
		add	Calcoloid Olive TCC, TRRC	CCC
	CI Solubilised Vat Black 25	*add*	Soledon Olive D	ICI
2561	CI Vat Black 27	*delete*	Calcosol Olive R	CCC
		add	Caledon Olive RP	ICI
2572	CI Azoic Diazo Component 2	*add*	Amarthol Fast Orange GC Base	Amar
2573	CI Azoic Diazo Component 3	*add*	Amarthol Fast Scarlet GG Base, GGS Base	Amar
2574	CI Azoic Diazo Component 4	*add*	Amarthol Fast Garnet GBC Base	Amar
2578	CI Azoic Diazo Component 8	*add*	Amarthol Fast Red GL Base	Amar
2579	CI Azoic Diazo Component 9 under "Stabilised Diazo Salt"	*for*	Azofix Red 3GK	FDC
		read	Azofix Red 3GL Salt	FDC
2580	CI Azoic Diazo Component 10	*add*	Amarthol Fast Red RC Base	Amar
2586	CI Azoic Diazo Component 20	*add*	Naphtoelan Blue BB Base	Pol
2592	CI Azoic Diazo Component 32	*add*	Amarthol Fast Red KB Base	Amar
2593	CI Azoic Diazo Component 33	*add*	Brentamine Fast Red FR Base	ICI
		add	Brentamine Fast Red FR Salt	ICI
2604	CI Azoic Diazo Component 44	*add*	Amarthol Fast Yellow GC Base	Amar
2610	CI Azoic Diazo Component 50	*add*	Brentamine Fast Scarlet AT Salt	ICI
2616	CI Azoic Coupling Component 12	for	Brenthol ITR	ICI
		read	Brenthol LTR	ICI
2617	CI Azoic Coupling Component 13	*add*	Amarthol AS-SG	Amar

Page	Colour Index Designation			
2617	CI Azoic Coupling Component 14	*add*	Amarthol AS-PH	Amar
2618	CI Azoic Coupling Component 18	*add*	Amarthol AS-D	Amar
		add	Brentosyn OT	ICI
2620	CI Azoic Coupling Component 24	*add*	Brenthol MA	ICI
	CI Azoic Coupling Component 25	*add*	Brenthol RB	ICI
2635	CI Azoic Orange 2	*add*	Brentogen Orange G	ICI
2645	CI Azoic Red 16	*add*	Brentogen Bordeaux R	ICI
2657	CI Azoic Violet 1	*add*	Brentogen Violet B	ICI
	CI Azoic Violet 2	*add*	Brentogen Red Violet 2R	ICI
2662	CI Azoic Blue 6	*add*	Brentogen Blue B	ICI
2677	CI Azoic Black 3	*delete*	Rapidogen Black ITA	G
2684	CI Oxidation Base 3	*add*	Soloxan Black S	ICI
		add	Soloxan Black SN	ICI
2703	CI Pigment Yellow 2	*add*	Tertropigment Yellow GR	CT
2707	CI Pigment Yellow 12	*add*	Monolite Yellow GTN	ICI
	CI Pigment Yellow 13	*add*	Tertropigment Fast Yellow VGR	CT
		add	Tertropigment Yellow PGR	CT
2708	CI Pigment Yellow 14	*add*	Tertropigment Fast Yellow VG	CT
		add	Tertropigment Yellow BG	CT
		add	Vynamon Yellow 2EG	ICI
2722	CI Pigment Orange 13	*add*	Monolite Fast Paper Orange G	ICI
2725	CI Pigment Red 2	*add*	Monolite Fast Paper Red 2R	ICI
2727	CI Pigment Red 5	*add*	Monolite Fast Carmine B, BV	ICI
2738	CI Pigment Red 44	*add*	Vulcafor Fast Red M	ICI
2739	CI Pigment Red 48	*add*	Calcium salt Rubine Toner 2BO	ICI
2740	CI Pigment Red 49	under	Sodium salt	
		add	Vulcafor Red R	ICI
2748	CI Pigment Red 63	*add*	Calcium salt Claret Toner 13554	ICI
2764	CI Pigment Violet 3	*add*	Fastel Violet R	ICI
2773	CI Pigment Blue 15	*add*	Monastral Fast Blue BNV, BX, LBC, LBX	ICI
		add	Monastral Fast Paper Blue B	ICI
		add	Polymon Blue B, LB	ICI
2783	CI Pigment Green 7	*add*	Monastral Fast Green GV, GX	ICI
		add	Polymon Green G	ICI
2784	CI Pigment Green 10	*add*	Monolite Fast Green Y	ICI
2785	CI Pigment Green 13	*add*	Vulcafor Green LN	ICI
2791	CI Pigment Brown 1	*add*	Monolite Fast Brown 3GV	ICI
2806	CI Pigment White 18	*add*	Calofil A.4, B.1, E.2	Stu
		add	Calofort S, T, U	Stu
		add	Calopake F, FS, H	Stu
		add	Calopake—High Opacity	Stu
		add	Sturcal D, F, H, L, LS, M	Stu
		add	Sturcal-X	Stu

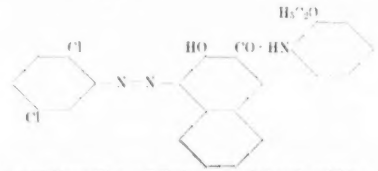
Page	Colour Index Designation			
2817	CI Solvent Yellow 2	*add*	Waxoline Yellow ADM	ICI
2821	CI Solvent Yellow 14	*add*	Waxoline Yellow IM, IP	ICI
2847	CI Solvent Red 14	*add*	Seriplas Scarlet B	YDC
2850	CI Solvent Red 24	*add*	Waxoline Red OM	ICI
2854	CI Solvent Red 35	*add*	Methasol Fast Red 3B	ICI
2859	CI Solvent Red 53	*add*	Seriplas Red 2B	YDC
2883	CI Solvent Blue 36	*add*	Waxoline Blue A, AM, AP	ICI
	CI Solvent Blue 37	*add*	Methasol Blue RL	ICI
	CI Solvent Blue 38	*add*	Methasol Fast Blue 2B	ICI
2927	CI Developer 8	*add*	Beta Oxynaphthoic Acid	RL
		add	Brentosyn BB	ICI
		add	Developer BON	RL
2928	CI Developer 14	*add*	Metatoluylenediamine	RL

VOLUME 3

Amendments

Page	Colour Index No.
3035	*add*

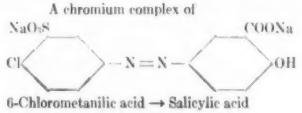
12470 CI Pigment Orange 22 (*Reddish orange*) *Discoverer*—Chemapol



2,5-Dichloroaniline → 3-Hydroxy-2-naphth-*o*-phenetidide

3036	under 12770 CI Disperse Yellow 4 (*Bright yellowish green*)
	add CI Solvent Yellow 17 (*Greenish yellow*)
3051	*add*

14007 CI Acid Yellow 120 (*Yellow*) *Discoverer*—Chemapol



6-Chlorometanilic acid → Salicylic acid
and convert to the chromium complex

3106	for 18070
	read 18070★
	add Calcocid Ceresine (CCC)
	add Serisine B (CCC)
3109	*beneath* 18736 CI Acid Red 180 (*Red*)
	add 18736A CI Solvent Orange 6 (*Reddish orange*)

Page	Colour Index No.

add	Calopake—High Opacity	Stu
add	Sturcal D, F, H, L, LS, M	Stu
add	Sturcal-X	Stu

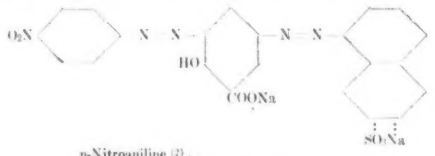
add Calcocid Ceresine (CCC)
add Serisine B (CCC)

3109 *beneath* 18736 CI Acid Red 180 (*Red*)
add 18736A CI Solvent Orange 6 (*Reddish orange*)

Page *Colour Index No.*

3128 *add*

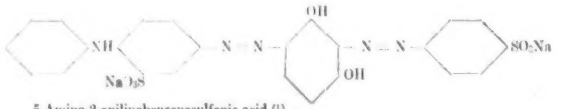
20151 CI Mordant Brown 90 (*Brown*) *Discoverer*—Chemapol



p-Nitroaniline (2) → Salicylic acid
1,6(and 1,7)-Cleve's acid (1) →

3129 *add*

20175 CI Acid Brown 213 *Discoverer*—Pol



5-Amino-2-anilinobenzenesulfonic acid (1) → Resorcinol
Sulfanilic acid (2) →

3147 *add*

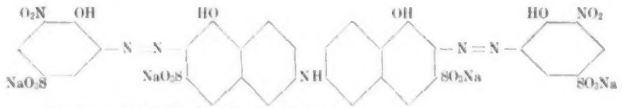
22046 CI Direct Violet 88 *Discoverer*—Pol

Benzidine → *m*-Phenylenediamine
→ (*Alk*) H acid

3249 *add*

29128 CI Direct Blue 184 *Discoverer*—Pol

A copper complex derived from



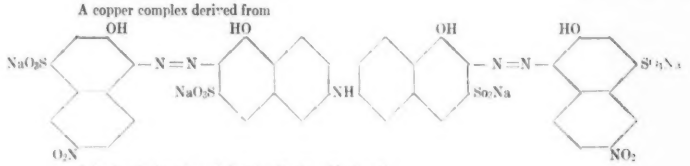
2-Amino-6-nitro-1-phenol-4-sulfonic acid (2 mol)
→ 6,6′-Iminobis-1-naphthol-3-sulfonic acid;
and convert to the copper complex

Page *Colour Index No.*

add

29130 CI Direct Blue 185 *Discoverer*—Pol

A copper complex derived from

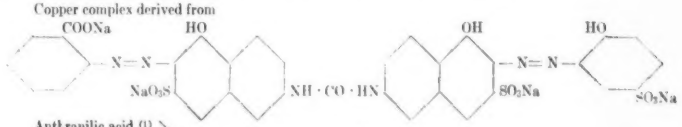


1-Amino-6-nitro-2-naphthol-4-sulfonic acid (2 mol)
→ 6,6′-Iminobis-1-naphthol-3-sulfonic acid;
and convert to the copper complex

add

29167 CI Direct Red 99 (*Bluish red → bordeaux*)

Copper complex derived from

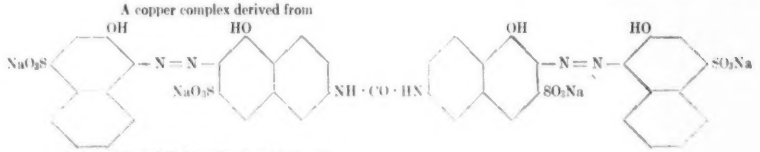


Anthranilic acid (1) →
6,6′-Ureylenebis-1-naphthol-3-sulfonic acid
2-Amino-1-phenol-4-sulfonic acid (2) →
and convert to the copper complex

3251 *add*

29232 CI Direct Violet 87 *Discoverer*—Pol

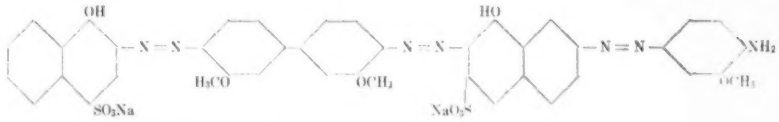
A copper complex derived from



1-Amino-2-naphthol-4-sulfonic acid (2 mol)
→ 6,6′-Ureylenebis-1-naphthol-3-sulfonic acid;
and convert to the copper complex

3283 *add*

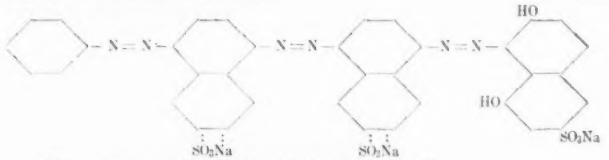
31951 CI Direct Blue 183 *Discoverer*—Pol



Nevile and Winther's acid →
o-Dianisidine
(*alk*) Gamma acid → *o*-Anisidine

Page	Colour Index No.
3293	*add*

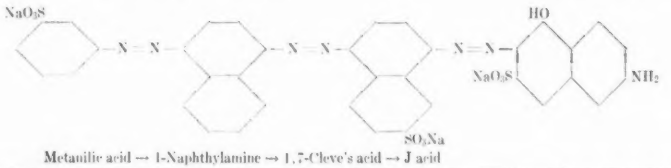
34100 CI Direct Black 101 — *Discoverer*—Pol



Aniline → 1,6(and 1,7)-Cleve's acid → 1,6(and 1,7)-Cleve's acid → 4,6 Dihydroxy-2-naphthalenesulfonic acid

add

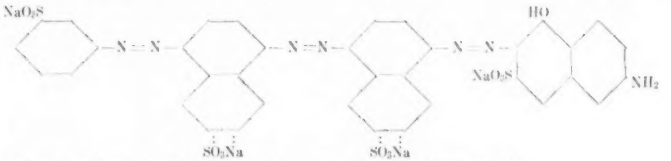
34139 CI Direct Blue 186 — *Discoverer*—Pol



Metanilic acid → 1-Naphthylamine → 1,7-Cleve's acid → J acid

3294	*add*

34146 CI Direct Blue 187 — *Discoverer*—Pol

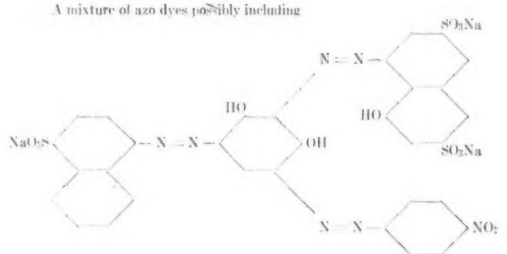


Metanilic acid → 1,6(and 1,7)-Cleve's acid → 1,6(and 1,7)-Cleve's acid → J acid

3298	*add*

34907 CI Acid Brown 214 — *Discoverer*—Pol

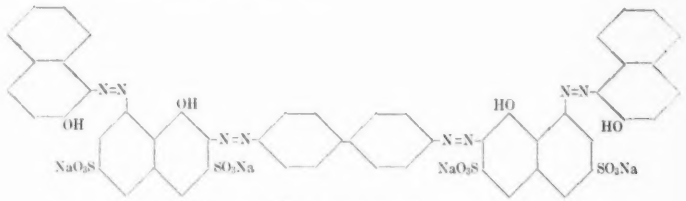
A mixture of azo dyes possibly including



[Naphthionic acid (1) → Resorcinol] ←(2) H acid ←(2) *p*-Nitroaniline

Page	Colour Index No.
3305	*add*

35415 CI Direct Black 100 — *Discoverer*—Pol

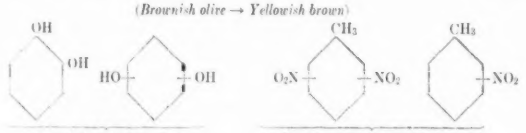


Benzidine → *(alk)* H acid (2 mol) → 2-Naphthol (2 mol)

3447	*add*

53218 CI Sulphur Brown 62 — *Discoverer*—Chemapol

(Brownish olive → Yellowish brown)



Catechol and other bivalent phenols

Residue from manufacturer of Dinitrotoluene

Heat these intermediates with sodium tetrasulfide

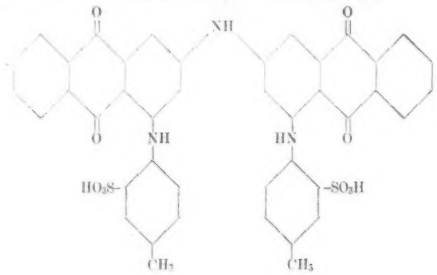
3488	*add*

59856 CI Vat Blue 51

Treat violanthrone with half the quantity of hydroxylamine used in the preparation of CI 59855

3513	*add*

65008 CI Acid Black 97 (*Greenish grey*) — *Discoverer*—Chemapol



4579 4577 4576 4568 4466 4465 4464 4463 4334 4269 4248 4204 4173 4171 4170 4162 4008 4004

VOLUME 4

Amendments

4004				*add* Stu John & E Sturge Ltd, Birmingham, England			
4008				*add* Sturge, John & E Ltd, Birmingham, England (Stu)			
4162	for	Brenthol ITR	ICI				
	read	Brenthol LTR	ICI				
4170	for	Calcocid Alizarine Violet NC	CCC				
	read	Calcocid Alizarine Violet RNC	CCC				
4171	for	Calcocid Ink Blue R	CCC	CI Acid Blue 93	1271	42780	
	read	Calcocid Ink Blue R	CCC	CI Acid Blue 22	1239	42755	
4173	for	Calcoloid Brown RRP	CCC				
	read	Calcoloid Brown RRWP	CCC				
	for	Calcomine Black G	CCC				
	read	Calcomine Black EXL	CCC				
	for	Calcomine Dark Blue B	CCC				
	read	Calcomine Dark Blue BN	CCC				
4204	for	Cibanone Olive 2B	CAC, Ciba				
	read	Cibanone Olive FB	CAC, Ciba				
4248	for	Direct Supra Light Violet MRL	ICS	CI Direct Violet 55	2159	17515	
	read	Direct Supra Light Violet MRL	ICS	CI Direct Violet 46	2156	17515	
4269	for	Fast Light Red BG	YDC				
	read	Fast Light Red GL	YDC				
4334	*beneath*	Lake Orange GR	IG				
	add	Lake Orange RO	Pol	CI Acid Orange 8	1057	15575 (Ba Lake)	
	for	Lake Red RBKK	Pol				
	read	Lake Red RBKX	Pol				
	for	Lake Red RCKK	Pol				
	read	Lake Red RCKX	Pol				
	beneath	Lake Yellow	NAC				
	add	Lake Yellow SWN	Pol	CI Acid Yellow 1	1003	10316 (Ba Lake)	
4463	for	Tertrochrome Black A	CT				
	read	Tertrochrome Black GA	CT				
4464	for	Tertrodirect Black V	CT	CI Direct Black 28	2335	35260	
	read	Tertrodirect Black V	CT	CI Direct Black 19	2332	35255	
	for	Tertrodirect Brown CBO	CT				
	read	Tertrodirect Brown CB	CT				
4465	for	Tertrodirect Pink RD	CT				
	read	Tertrodirect Pink DR	CT				
4466	for	Tertroxane Orange R	CT				
	read	Tertroxane Orange RN	CT				
4568	in	2504 under CI Vat Blue 20					
	delete	*add* Monolite Blue 3R	ICI				
4576	3053 for *add* 14058 Mordant Yellow *read* *add* 14058 CI Mordant Yellow 60						
4577	3106 for *add* 18092 Mordant Green *read* *add* 18092 CI Mordant Green 52						
4579	3564 for *add* 73685 Vat Green *read* *add* 73685 CI Vat Green 25 (*Green*)						

COUNCIL REPORT

214th Meeting • April 3, 1959 • New York, NY

REQUIREMENTS for amending the Bylaws providing for an Executive Committee of the Council have been met, in accordance with Article XIV of the Bylaws, which states. . . . "As provided in the Constitution, the Council may amend these Bylaws by a two-thirds affirmative vote of its entire membership. This shall be by letter ballot, after the proposed amendment has been submitted to a meeting of the council."

The proposed amendments were submitted to Council at its April 3, 1959 meeting.

These were the same as published on page 56 of the February 23, 1959 issue of the *Proceedings,* except for the first paragraph of Article IV, Section 2 pertaining to the makeup of the Executive Committee, which now reads:

"The Executive Committee of the Council shall be composed of the President, as Chairman, the Vice Presidents, the Treasurer, the latest living Past President; and the Chairman of the Executive Committee on Research and the Executive Secretary as nonvoting members".

Announcement of a better than a two-thirds affirmative vote on the amendments was made to Councilors on April 15, 1959.

* * *

A proposal by John A Komninos, National Councilor representing the Metropolitan Section, to amend the Constitution to limit the term of president to two years was read to the Council by Executive Secretary George P Paine and referred to the Committee on Constitution and Bylaws, which will report at the May 29th meeting.

* * *

A proposal by A Henry Gaede, chairman of the Study Committee on Service Awards, to name the recently approved Service Award "The Harold C Chapin Service Award" was unanimously approved by Council.

President Helmus announced that the work of the Study Committee was now completed, and Council voted to discharge the Committee with thanks.

In line with the recommendations of the Study Committee (see page P852 of the December 1, 1958 issue), a permanent committee is now being formed, which will consist of one member from each of the four National Regions, to be selected by the Councilors of the respective Regions; the president of the Association, ex officio; and the executive secretary serving as secretary of the Committee without vote. Geo O Linberg, as the senior member whose term first expires, will serve as the first chairman of the new Committee.

* * *

Elliott Morrill, reporting for the Committee on Membership and Local Sections, reported that the Association membership stood at 6630 as of March 27. He called attention to the new membership application form now being used by the Association, and the new multicolored promotional brochure prepared by National Headquarters entitled "Do You Belong . . ."

* * *

For the National Conventions Committee, Chairman Ernest R Kaswell reported that the Committee was considering both New York and Boston as the site of the 1963 Convention. If the Metropolitan Section elects to sponsor the 1963 Convention in New York, the 1964 Convention will probably be held in Boston.

Council approved the appointment of Jack G Kelley as a member of the Conventions Committee.

* * *

For the Technical Committee on Research, Chairman Charles A Sylvester stated that the 198th meeting of TCR, held the previous day, speaks well for the progress and activities of AATCC research. He stated that 19 research committees had met the previous two days with 11 reporting at the TCR meeting attended by 50 persons.

Certificates of merit for outstanding service to the Association and to industry were awarded at the TCR meeting to the following:

Paul B Stam and Arthur R Wachter, retiring members, Executive Committee on Research; Matthew J Babey, retiring vice chairman, Technical Committee on Research; and retiring chairmen Albert E Johnson, Committee on Drycleaning Test Methods, J Ernest Meili, Committee on Colorfastness to Pleating, Rudolph C Geering, Committee on Flammability of Clothing Textiles, and George S Wham, Committee on Wash and Wear.

The following retiring chairmen of committees were unable to be present and will be presented with certificates at meetings of their local sections:

J F Cooke, Committee on Resist-

President Weldon G Helmus (center) presented Certificates of Service at the 198th meeting of the Technical Committee on Research to (l to r): R C Geering, A E Johnson, J E Meili, G S Wham, A R Wachter, and M J Babey. The Certificate is presented in recognition of leadership and in appreciation of technical and scientific contributions to AATCC and to industry.

ance to Abrasion; Henry E Millson, Committee on Colorfastness to Crocking; L R Burgess, Committee on Definitions; B R Norwick, Committee on Identification of Finishes on Textiles; Jules Labarthe, Committee on End-Usage Performance Tests; Frank J Rizzo, Committee on Weathering of Textiles; R H Souther, Committee on Stream Sanitation; M W Goodell, Committee on Colorfastness to Hot and Dry Pressing; I Schwartz, Committee on Antibacterial Agents; Charles Minoff, Committee on Colorfastness to Perspiration; L L Heffner, Committee on Evaluation of Fire-Resistant Textiles; J A Zapp, Committee on Dermatitis; and Paul V Seydel, Committee on Evaluation of Desizing Agents.

Chairman Sylvester reported that TCR had approved two new tentative test methods since its last meeting: 1) Abrasion Resistance of Fabrics—Evaluation of Wear by Means of the Accelerotor, and 2) Analysis of Finish in Textiles. The votes last showed better than 95% approval for both Methods of test.

Mr Sylvester advised that the joint AATCC-CATCC technical meeting to be held May 29th in Montreal, Canada, will take the form of a panel discussion with AATCC appointing six men to present talks of 10-15 minutes duration on the following subjects: Wash and Wear, Colorfastness to Light, Colorfastness to Washing, Chlorine Retention, Consumer Complaints and Dimensional Changes. The chairmen of the committees directly concerned will be asked to give the talks and participate in the panel discussion.

CATCC will appoint six men to assist in the question-and-answer period and a moderator to handle the meeting.

* * *

For the Executive Committee on Research, Chairman Charles W Dorn reported that the following new members of respective research committees had been approved:

John J Fox replaces N B Gobeil on the Committee on Colorfastness of Textiles to Atmospheric Contaminants; Eugene Gula replaces Mr Gobeil on the Committee on Colorfastness to Washing; R T Graham to the Committee on Evaluation of Finishes for Resistance to Soiling and the Committee on Water Resistance of Fabrics; F Best to the Committee on Colorfastness to Pleating; S P Hersh to the Committee on Antistatic Finishes; Esther M McCabe to the Committee on End-Usage Performance Tests and secretary of the Committee on Wash and Wear; N M Gobeil to the Committee on Wash and Wear, replacing P B Stam; R L Stutz to the Committee on Colorfastness to Pleating; G L Drake to the Committee on Evaluation of Fire-Resistant Textiles; J P Dalton Jr to the Committee on Stream Sanitation; G O Linberg to the Committee on Determination of Odors in Resin-Treated Fabrics; A D Wachter to the Committee on End-Usage Performance Tests; and R L Amsler and S J O'Brien to the Committee on Soiling of Carpets.

Resignations of Paul B Stam from the Committee on Resistance to Abrasion and H Moore from the Committee on Test Fabrics were accepted.

ECR approved the appointment of Ethel C E McNeil as chairman of the Committee on Antibacterial Finishes. It also approved the appointment of Hugh R Davidson as a voting delegate from AATCC to the Inter-Society Color Council, replacing the late Frank J O'Neil.

The resignation of H W Leitch from the Reference Committee on Material for Construction of Dyeing and Finishing Machinery was accepted. Inasmuch as this Reference Committee has been listed in the *Technical Manual* for many years and has not been used, it was decided to drop it from the roster.

ECR has approved the changing of the name of the Committee on Antistatic Finishes to the Committee on Static Properties of Textiles. This Committee has requested that TTM #76-1954, Determination of the Electrical Resistivity of Fabrics, be made a Standard Test Method. ECR approved the submitting of this matter to Council for action.

After hearing a report from R C Geering, AATCC's representative on the National Fire Protection Association's Committee on Flammability of Textiles, ECR has decided to explore the possibility of referring this subject to the American Standards Association.

ECR continues to study the subjects of the 1959-50 research budget, international test methods, relations with foreign groups, and long-range research objectives of AATCC.

* * *

P J Wood, chairman of the Study Committee on Endowment Fund, submitted the following report to Council:

"We recommend the establishment of an AATCC Endowment Fund.

"We recommend that Council change the Constitution and Bylaws in whatever way is necessary to accomplish this purpose by reference to the Committee on Constitution and Bylaws.

"We recommend by such action the setting aside of our total invested securities as a basis of such fund exclusive of savings bank accounts and treasury bills needed for the current business of the Association. This amount totals at cost—approximately $300,000.

"We recommend to Council that this fund be cared for by an appropriate board of trustees and be irrevocable, except by two-thirds vote of the entire Council by ballot.

"We recommend to Council that the above board of trustees be made up of the Appropriations Committee and three other past presidents of the Association selected by the president.

"We recommend to Council that the net proceeds from this fund which may be received in the form of dividends after necessary expenses of acquiring advantageous rights or other partial stock dividends be used in the following manner:

A) Up to and not to exceed $10,000 of net proceeds may be used for the purpose of providing a suitable pension plan for the paid employees of the Association when and if such a plan is approved by the Appropriations Committee and the Council.

B) Any excess over the above mentioned $10,000 shall become part of the general fund of the Association for its research activities."

No action was taken by Council at this meeting.

* * *

For the Publications Committee, Chairman Paul J Luck, reported that the following committee had been formed to investigate future possibilities in the marketing of the 2800 copies of the "Vat Monograph" that the Association has in stock: Geo O Linberg, chairman, William Fayssoux, Raphael E Rupp, Francis H Casey, and William A Holst.

On the recommendation of the Publications Committee, Council approved the purchase of needed supplies and equipment for the use of the editor of the *Technical Manual* and *Colour Index* coordinator, the employment of part-time secretarial assistance for him, and the appropriation of $2000 to be drawn upon as needed for these purposes.

* * *

For the Archives Committee, Chairman Sidney M Edelstein reported that, in line with the general terms suggested by the Committee, the Lowell Technological Institute

has expressed an interest in establishing an Institute for the History of Dyeing and Finishing in joint collaboration with Massachusetts Institute of Technology, Harvard University, and possibly other institutions.

Dr Edelstein introduced Martin J Lydon, president of LTI, who spoke briefly on plans for proceeding with this project.

Dr Edelstein acknowledged with thanks two gifts to the Committee—a copy of the Vat Monograph autographed by the authors, which was given by Raymond W Jacoby, and an original autographed letter of William H Perkin, given by Bernard K Easton.

* * *

Albert E Johnson, chairman of the Committee on Corporate Membership, gave an encouraging picture of the present program. He reported a Corporate Membership of 291 as of the date with a total dues payment well in excess of $50,000.

* * *

Executive Secretary George P Paine called attention to a booklet, "Guide for AATCC Authors and Speakers", which was prepared by National Headquarters. This attractive multi-colored publication will be sent to all section officials for their guidance. It incorporates the information contained in the "Notice to Authors", which appears periodically in the *Proceedings*, while offering additional helpful information on AATCC requirements, procedures, etc.

* * *

Roland E Derby, chairman of the Appropriations Committee, announced that his Committee had thoroughly reviewed the Employee Pension Plan submitted by the Employee Retirement and Pension Committee. It was the finding of the Appropriations Committee that the Plan as submitted was not workable within the current budget. The report has been returned to the Employee Retirement and Pension Committee with the recommendation that it explore comparative costs of an Association-financed plan in an effort to avoid the relatively high expense of a funded plan as had been submitted.

Council approved a series of salary increases at National Headquarters, effective May 1, 1959, as well as a slight increase in the appropriation for the payment of auditing fees.

* * *

The next meeting of the Council will be held May 29, 1959 at the Sheraton-Mount Royal Hotel, Montreal, Canada, at the invitation of the Canadian Association of Textile Colourists and Chemists.

Activities of the Local Sections

Pacific Southwest

PACIFIC SOUTHWEST Section met April 10, 1959 at the Western Carloading Public Relations Suite, Los Angeles, Calif, with approximately 40 members and guests in attendance.

Speaker of the evening was A C Hall, member of the Mayor's Textile Committee for the Development of the Textile and Apparel Industries. His talk was entitled, "Probability of a California Textile Mill".

—◆—◆—

Metropolitan

METROPOLITAN Section met April 10, 1959 at Kohler's Swiss Chalet, Rochelle Park, NJ, with Chairman John A Komninos presiding.

A panel consisting of Frank Percarpio, president, Northern Dyeing Corp, Washington, NJ; Robert M Lesh, superintendent, Northern Dyeing Corp; and John S Thackrah, E I duPont de Nemours & Co, Inc discussed the practical experience, economics of installation, operation and direct results of the Pad-Roll Dyeing Machine, which is manufactured by Svenska Textilmaschinfabriken, AB, Göteberg, Sweden.

Mr Percarpio opened with a discussion of the economics of operating the machine and the problems of installation and operation of such equipment in this country.

(Photo by Edward Artim)

SPEAKERS AT APRIL 10TH MEETING, METROPOLITAN SECTION — L to r: Frank Percarpio, president, Northern Dyeing Corp; John S Thackrah, E I duPont de Nemours & Co, Inc; Robert M Lesh, superintendent, Northern Dyeing Corp

Mr Lesh, in his talk entitled "A Brief Look at the Pad-Roll Dyeing Technique", discussed the details of the unit in use at Northern Dyeing Corp as well as the problems involved in making acceptable shade matches and in laboratory dyeings for use by the plant production machine. He supplemented his discussion with diagramatic sketches and an 8-mm color movie.

Mr Thackrah discussed the economic and technical aspects of dyeing and dyes for the pad-roll technique.

P J Fynn, technical program chairman for the Section, served as moderator for the question-and-answer period which followed.

Attendance at the meeting was 216.

Future Papers

THE following list is comprised of papers submitted to date for publication in future issues of the *Proceedings*. Authors and Technical Program Chairmen are requested to examine this list and call our attention to any omissions.

Papers Presented at the 1958 Convention

"Recent Advances in the Dyeing of Acrilan Acrylic Fiber"— E V Burnthall, The Chemstrand Corp

"The Demetalization and Leveling of Chrome-dyed Wool Pieces"—H E Millson, American Cyanamid Co

Papers Presented before Local Sections

"Reactive Dyestuffs" — Ernest L Caswell, Ciba Co Inc

"Acetate—A Basic Fiber for Nonwovens"—J L Barach and H W Coates, Celanese Corp of America

"Polymers as Related to Fabric Processing" — D Donald Gagliardi, Gagliardi Research Corp; Victor S Frank, Dewey & Almy Chemical Co; Lloyd H Perry, UBS Chemical Co; and Herman Mark, Polymer Research Inst

"Decorative Fabrics from Fibrous Materials"—Frank J Lachut, Owens-Corning Fiberglas Corp

"A Mild Cure Catalyst"—James B Irvine, Quaker Chemical Products Corp

"Mechanisms Influencing the Wash and Wear Characteristics of Cellulosic Fabrics"—C R Williams, Monsanto Chemical Co

"Use of Polyethylene Emulsions in Textile Applications"—R Rosenbaum, Semet-Solvay Petrochemical Div

"Fluorochemicals: The New Idea in Textiles"—Edwin J Grajeck and William H Peterson, Minnesota Mining & Mfg Co

"Blends of Polyfibers with Cotton. Advantages—Dyeing and Finishing Techniques"—Morton Santymire, E I duPont de Nemours & Co, Inc

"Probability of a California Textile Mill"—A C Hall, Mayor's Textile Committee for the Development of the Textile and Apparel Industries (Los Angeles)

"Synthetic and Natural Fiber and Yarn Processing Aids"— Charles H Lightpipe and Ralph G Schaubhut, Nopco Chemical Co

Elected to Membership

April 9, 1959

SENIOR

Albert L Barton
George H Best
William M Brown
Joseph T Cavedon
William P Creighton
Stanley Deckelbaum
Gil M Dias
John J Fox
James G Gilstrap
Felix E Gund
George E Hine
Richard Hudak
Rudolf H Joon
Esther M McCabe
Ethel C E McNeil
Raymond J Nemeth
Julius Pasquariello
John B Porter
Sekiaki Sakai
Jerome B Schapiro
Robert D Smith
Robert L Steward
Evans M Swiss
Paul Weise
Albert I Zuckerman

JUNIOR

William A Brandon
Merritt W Bremer
Edward B McLean

ASSOCIATE

Steven F Cerny
Kenneth DeNoble

STUDENT

James C Alosi
John C Burcham
Donald J Delano
Charles F Messier
Robert E Morris
Alexander Parsons
Carol M Scully
Edward P Whitty
Samuel H Swint
Mary R Gormally

TRANSFER TO SENIOR

Also A Fumagalli
Clarence E Gibson
Ralph A Stanziola
Javier P Suarez
Arthur L Watson

TRANSFER TO JUNIOR

Bobby J Bailey
Gordon H Howard

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES

May 29, 1959 (Mount Royal Hotel, Montreal, Canada) AM-Council meeting; PM-Joint luncheon and technical session with CATCC; Sept 9-11 (Hotel McAlpin, New York, NY); Sept 9—Research Committees; Sept 10—Council Committees, TCR, ECR; Sept 11 (AM)—Council Meeting

NATIONAL CONVENTIONS

Oct 8-10, 1959 (Sheraton Park and Shoreham Hotels, Washington, DC); Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa); September 28-30, 1961 (Buffalo, NY); 1962 (Southern Region)

DELAWARE VALLEY SECTION

May 22 (Annual Outing—Philmont Country Club, Huntingdon Valley, Pa)

HUDSON-MOHAWK SECTION

May 22 (Ladies night, Schuyler Meadow Country Club, Albany, NY); June 26 (Annual outing—Antlers Country Club, Amsterdam, NY)

METROPOLITAN SECTION

May 15 (Ladies Night, Kohler's Swiss Chalet, Rochelle Park, NJ); June 19 (Outing—North Jersey Country Club, Wayne, NJ)

MID-WEST SECTION

June 12-13 (Outing—Brown Lake Resort, Burlington, Wis); Oct 24 (Bismarck Hotel, Chicago, Ill)

NIAGARA FRONTIER SECTION

June 12 (Annual Outing—St Catherines, Ont, Canada); Sept 25 (Niagara Falls, Ont, Canada); Dec 11 (Annual business meeting, Buffalo, NY)

NORTHERN NEW ENGLAND SECTION

May 15 (Joint meeting with LTI Student Chapter, Lowell Technological Inst, Lowell, Mass); Sept 18 (Outing—Wachusett Country Club, West Boylston, Mass); Oct 16 (Lexington Inn, Lexington, Mass); Dec 4 (Joint symposium with ASME Textile Engineering Div, Smith House, Cambridge, Mass); Jan 15 (Woodlawn Golf Club, Newton, Mass)

PIEDMONT SECTION

June 5-7 (Outing—Grove Park Inn, Asheville, NC); Sept 25-26 (Barringer Hotel, Charlotte, NC)

RHODE ISLAND SECTION

June 12 (26th Annual Outing, Metacomet CC); Sept 18 (Management Night); Oct 23 (Prov Eng Soc, Providence, RI); Dec 4 (Annual Meeting—Johnson's Hummocks Grille, Providence, RI)

SOUTH CENTRAL SECTION

June 26-27 (Outing—Riverside Hotel, Gatlinburg, Tenn); Sept 19 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION

June 12-14 (Summer Outing — Radium Springs, Ga); Sept 12 (Ida Cason Callaway Gardens, Pine Mtn, Ga); Dec 5 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION

May 15 (Ladies' Night—Rapp's Paradise Inn, Ansonia, Conn); June 12 (Outing—Wallingford, Conn); Sept 25 (Blake's Restaurant, Springfield, Mass); Oct 23 (Annual Meeting—Rapp's Restaurant, Shelton, Conn); Dec 4 (Hartford, Conn)

MAKE YOUR PLANS
NOW
TO ATTEND THE
1959 AATCC Convention
Washington, D C • Oct 8-10

COUNCIL TO MEET IN MONTREAL MAY 29
Joint AATCC-CATCC Technical Meeting to Follow

AATCC COUNCILORS will venture north of the border for their next meeting on Friday morning, May 29, at the Sheraton-Mt Royal Hotel, Montreal, Quebec. The meeting is being held in Canada at the invitation of the Canadian Association of Textile Colourists and Chemists.

In the afternoon, a joint technical meeting will be held, at which the following AATCC committee chairmen will present 10-15-minute talks on the activities of their respective TCR subcommittees: Graham B Richardson, Wash and Wear; Joseph E Norton, Colorfastness to Light; Ralph B Smith, Colorfastness to Washing; Richard F Aurich, Damage Caused by Retained Chlorine; Albert E Johnson, End-Usage Performance Tests; and John F Warner, Dimensional Changes in Textile Fabrics. CATCC also will appoint six men to participate in the panel discussion and a moderator to handle the meeting.

A reception following the technical meeting and golf the following morning will round out the program.

Membership Applications

SENIOR

Clyde A Farris Jr —— President, Water Services Inc, Knoxville, Tenn. Sponsors: W S Quigg, C W Braswell. (SC).

Albert L Gardner——Dyer, Dundee Mills Inc, Griffin, Ga. Sponsors; E M Williams Jr, T M Fergerson. (S).

Edwin J Izzo——Production foreman, dyeing, Van Raalte Co Inc, Saratoga Springs, NY. Sponsors: P A Chittenden, D J Lambert. (HM).

Fred P Kruger——Technician, textile-dye lab, United States Testing Co, Hoboken, NJ. Sponsors: A J Kellner, C A Baker. (M).

Jean F Mateson——President, Textile Adjuncts Corp, Easton R S Corp, Brooklyn, NY. Sponsors: H A Stauderman, C A Whitehead. (M).

Joseph M Middleton——Mgr, Georgia Hosiery Mills, Cave Spring, Ga. Sponsors: E M Williams, T M Fergerson. (S).

George J Motz——Sales rep, tech rep, Becco Chem Div, Food Machinery & Chem Corp, Buffalo, NY. Sponsors: M A Noonan, F A Kraft. (M).

Robert H Moyer——Chemist, E I duPont de Nemours & Co, Inc, New York, NY. Sponsors: K P Fergerson, B F Quigley. (M).

Robert H Quiri——Sales rep, Ritter Chem Co Inc, Amsterdam, NY. Sponsors: W A Nelson, A Mafilios. (HM).

Gordon M Smith——Dyer, Ludlow Mfg & Sales Co, Wilmington, Del. Sponsors: J K Coyne Jr, L K McChesney. (DV).

Mortimer E Stern——Director, tech market dev, Morningstar-Paisley Inc, New York, NY. Sponsors: I N Schafer, R P Morningstar. (M).

Robert H Terss——Research supv, E I duPont de Nemours & Co, Inc, Jackson Lab, Deepwater, NJ. Sponsors: R J Thomas, D R Baer. (M).

Michael Kent —— Market research, Celanese Corp of America, New York, NY. Sponsors: P C Duggan, B F Pimentel. (M).

JUNIOR

Howard Steinman——Lab tech, Otto B May Inc, Newark, NJ. Sponsors: E M May, F Rodgers. (M).

Alexandro W Merin——Tex engr, finishing dept, La Omega S A, Textile Finishing Factory, Calz Xochimilco, Mexico.

ASSOCIATE

Peter A Benoliel —— Tech sales, Quaker Chemical Prods Corp, Conshohocken, Pa. (DV).

Mildred Cates——Asst prof, clothing & tex, Mary Washington College of the Univ of Virginia, Fredericksburg, Va. (W).

Neal M Draper——Asst to pres, National Aniline Div, Allied Chem Corp, New York, NY. (M).

Jorge Estrada——Office Mgr, Celanese Mexicana, Mexico D F, Mexico.

Alan R Mitchell——Tech rep, Union Carbide Chem Co, Div Union Carbide Corp, Moorestown NJ. (DV).

Roger H Smith——Salesman, L H Butcher Co, Portland, Ore. (PN).

Troy B Terry Jr——Lab dyer, Collins & Aikman Corp, Albemarle, NC. (P).

STUDENT

Sandra J Franz and **Rosalind C Payne** —— Students, Purdue University, West Lafayette, Ind. Sponsor: R W Padgett.

Pravin T Shah——Student, Georgia Institute of Technology, Atlanta, Ga. Sponsor: W Postman.

TRANSFER FROM ASSOCIATE TO SENIOR

William H Byles——Latex chemist, Collins & Aikman Corp, Albemarle, NC. Sponsors: J Bauer, W D Hathcock. (P).

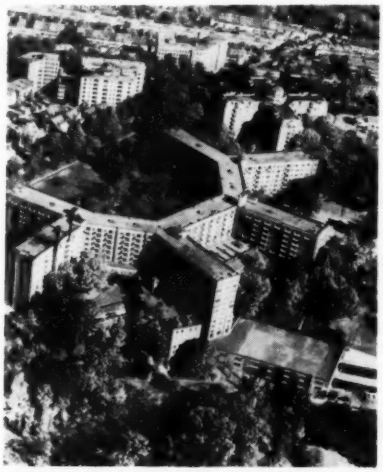
Joseph G Melton——Lab supv, J P Stevens & Co Inc, Greensboro, NC. Sponsors: P B Stam, L B Arnold Jr. (P).

James P Morgan—Tex technologist, product dev, investigations, Wool & Mohair Lab, USDA, Albany, Calif. (PS).

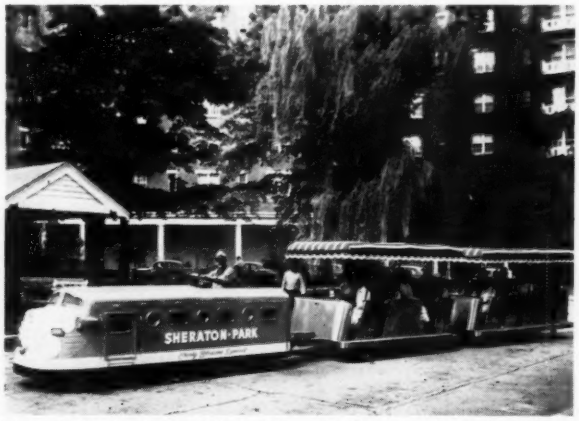
1959 AATCC NATIONAL CONVENTION

October 8, 9, 10 • Hotels Sheraton-Park & Shoreham, Washington, D C

VIEWS OF THE HEADQUARTERS HOTEL



Aerial view of the Sheraton-Park Hotel with part of the 16 acres of beautifully landscaped grounds



One of the facilities offered by the Sheraton-Park Hotel for transporting guests to the picturesque grounds

This large banquet and convention hall, set up for lecture purposes, illustrates the Sheraton-Park's capacity to handle the large number of visitors, both domestic and foreign, which are expected to attend the 1959 Convention

One of the smaller banquet halls showing one of the many unusual decorative masterpieces in artistic design

One of the formal public dining rooms

"THE APPLICATION OF VAT DYES"

Monograph No. 2

American Association of Textile Chemists and Colorists

MONOGRAPH NO. 2, which deals with "The Application of Vat Dyes" was prepared by a board of editors and collaborators in the American Association of Textile Chemists and Colorists. This group represents a complete cross-section of the entire industry so that the text of the Monograph represents information both from laboratory and practical plant standpoints.

The Monograph contains approximately 385 pages with contents of various chapters as follows:

I HISTORY — Natural Indigo and Tyrian Purple; Development of Synthetic Vat Dyestuffs; History of Application of Vat Dyes; The Application of Vat Dyes to Fibers Other Than Cotton.

II PRINCIPLES OF VAT DYE APPLICATION — Types and Forms of Vat Dyes in Commerce; Chemistry of Application; Stripping and Redyeing Faulty Vat Dyeings; Fastness; Print Discharges; Change of Shade in Artificial Light; Dichroic Dyes.

III APPLICATION TO COTTON RAW STOCK — Equipment Used; Methods of Color Application; Typical Examples.

IV APPLICATION TO COTTON SKEINS—Equipment and Methods.

V APPLICATION TO COTTON WARPS—Short Chain Method; Long Chain Warp Dyeing; Continuous Pigment Padding Method.

VI APPLICATION TO COTTON PACKAGES—The Package; Package Dyeing Machines; Chief Factors in Dyeing Packages with Vat Dyestuffs; Dyeing Speed and Levelling Power of Vat Dyes; Dyeing Methods; Oxidation and Finishing; Vat Dyeing on Beams; Illustrative Dyehouse Procedures.

VII APPLICATION TO COTTON PIECE GOODS—History; Jig Methods; Padding Methods; Continuous Methods; Overhead Reel Method; Vat Dyeing of Cotton Narrow Fabrics.

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XII INDIGO—History and Properties; Various Indigo Vats and their Preparation; Dyeing of Cotton with Indigo; Dyeing of Wool with Indigo; Application of Indigo to Cotton Printing; Indigo Derivatives.

XIII THE USE OF VAT DYES AS PIGMENTS OR IN NONTEXTILE APPLICATIONS — Paper, Rubber, Plastics and Resins; Fireworks; Paints and Lacquers; Resin-Bonded Pigments; Miscellaneous.

XIV LEUCOESTERS OF VAT DYESTUFFS — History and Chemistry; Properties; Application of Leucoesters; Lightfastness of Leucoesters; Relative Cost of Vat and Soluble Vat Dyeing.

XV TABULATION OF VAT DYESTUFFS—Formulae and Properties; Numerical Index; Alphabetical Index; Trade Names of American-Made Vat Dyes.

AUTHOR INDEX

SUBJECT INDEX

From the foregoing, it is seen that this Monograph gives a very comprehensive description of all of the factors involved in the application of vat dyes. In all discussions of application procedure, practical working formulas are given. This publication is of interest to all persons who are either producers or consumers of vat dyes.

The price of "The Application of Vat Dyes" is $5 per copy, postpaid, to members; to nonmembers it is $6 per copy. Please use the order form at the bottom of this page.

George P Paine, Executive Secretary
American Association of Textile Chemists and Colorists
P O Box 28, Lowell, Massachusetts

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News of the Trade

Allied Chemical Acquires Harmon Colors

Allied Chemical Corp has completed negotiations with B F Goodrich Co for acquisition by Allied of the business and assets of Harmon Colors, according to an announcement by Chester M Brown, president of Allied's National Aniline Division, made last month.

Harmon Colors, a leader in the field of specialty organic pigments for 40 years, has been part of B F Goodrich Chemical Co division. Headquarters, laboratories and manufacturing facilities are located at Haledon, NJ.

In making the announcement, Mr Brown said that "acquisition of Harmon Colors marks Allied's entry in the field of organic pigments." He pointed out that "by bringing together Allied's extensive resources in basic chemicals and the different backgrounds of its National Aniline Division and Harmon, the National Aniline Division will be able to offer industry a line of colors, both dyes and pigments. It gives us the ability to supply products we do not now make and broadens our technical knowledge to develop new and improved colors."

Harmon operations will continue as a unit under National Aniline's supervision. Its pigments will be marketed by the existing Harmon sales organization under the Harmon Colors tradename from its present general sales offices at Haledon. Management will remain under the direction of V C Vesce, technical director; H T Madden, plant manager; and F F Bingham, sales manager.

Harmon has long been a leader in 1916 in Brooklyn, NY, in conjunction with the then newly formed American dye industry. In 1927, the company decided to concentrate its research and product development efforts in the field of organic pigments. In 1936, the company moved its entire operation to Haledon.

The plant at Haledon employs 275 persons and is located on an 85-acre tract, which includes an 18-acre lake. The latter makes readily accessible the large quantities of water which are vital to a facility which uses almost a million gallons a day in its operations.

Harmon, has long been a leader in creating specialty light stable pigments and dispersions for metallic finishes. A major portion of these products has been consumed by the automotive finishes trade.

In recent years Harmon has broadened the base of its industry coverage by expanding into new fields. One of the most important of these is the textile industry to which Harmon has been supplying organic pigments, with the emphasis being on spin dyeing of synthetic fibers.

According to Mr Vesce, spin dyeing, in which the organic pigment becomes an integral part of the entire fiber, enables fabrics to retain their original colors almost indefinitely. With the constant expansion of synthetic fiber production, Harmon's patented process of blending pigments with synthetic polymers for ultimate use in spin dyeing becomes increasingly important and opens new markets to Allied Chemical, it was stated.

Schwarz, Speel & Associates Formed

Eugene W K Schwarz and Henry C Speel have announced the formation of Schwarz, Speel and Associates, textile and chemical consultants, with offices at 101 West 31st Street, New York 1, NY. The firm is affiliated with Skeist and Schwarz Laboratories of Newark. Associate consultants include Irving Skeist, polymer chemist; Harold E Bode, chemical economist; and Preston R Smith, chemical engineering specialist.

Dr Schwarz has advised that the new organization was established to more efficiently serve the needs of clients in today's increasingly more complex textile and chemical technology. He said it is becoming more difficult for the individual consultant to keep pace with the many new developments taking place except as regards the continually narrowing limits of his specialty. At the same time, the requirements of business and industrial clients demand an increasingly broader range of technical know-how which can best be supplied by an organization of consultants.

Schwarz, Speel and Associates is engaged in product development and marketing services with special emphasis on fiber development and textile dyeing and processing technology. Other fields represented are: plastics, petrochemicals, and surfactants. Clients abroad are served through affiliated consulting firms in several foreign countries.

Morningstar Forms Gum and Technical Products Dept

A new Gum and Technical Products Department, which will unify the operations of two previously distinct groups, has been formed by Morningstar-Paisley, Inc, New York, NY. The consolidation of the Technical Products Department with the Water-Soluble Gum Department reportedly will provide expanded sales and technical service to processors and manufacturers who use gums, starches and other specialty items for stabilizing, thickening, binding, gelling, sizing, coating, flocculating, encapsulating, etc. The new department will coordinate all technical activities dealing with gums and other specialties from the customer service standpoint at both the product development and product application levels.

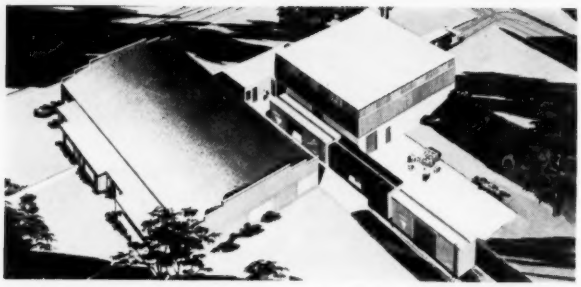
Morningstar

Malkovich

Thomas W Morningstar has been named general manager of the new department, and Mark P Malkovich, who has been specializing in product development, has been appointed sales manager. Mr Malkovich's prior associations were with Arnold, Hoffman & Co, Inc, J B Henriques, Inc, and General Mills, Inc.

Morningstar's service position in the water-soluble gum field was strengthened recently by the acquisition of Thurston & Braidich, reputedly oldest gum importer and processor in the country, and the establishment of a gum-processing plant in Hawthorne, NJ.

Thurston & Braidich personnel who have been incorporated into the new Department include Charles Rosevear Jr, administrative; Charles M Ferri, technical field service; and George Gilbert and James Sullivan, field sales. Other key members of the Department in sales assignments are John J Quinn and Robin T Hazell, Morningstar's Canadian sales and service representative with offices in Toronto, Ont.



Artist's sketch of E F Houghton's Carrolton, Ga Facilities

Houghton Southern Div HQ in New Georgia Plant

E F Houghton & Co, Philadelphia, Pa, is now serving Southern industry through its warehouse and office newly located in Carrollton, Ga.

Construction has been virtually completed on a new plant adjoining the present warehouse and office, which is served by the Central of Georgia Railroad as well as by truck lines covering the South.

Upon completion of the installation of manufacturing equipment, defoamers, wetting agents, detergents, warp sizes, finishes, lubricants, metal-working and heat-treating products will be produced locally.

In addition to the new Carrollton plant and the main plant in Philadelphia, Houghton operates plants in Chicago, Detroit, Minneapolis and San Francisco and in Toronto, Canada.

Southern Division Sales are under the supervision of A J Andre, who was formerly in charge of that operation at Charlotte, NC.

LTI Alumni to "Go Upstream"

"Upstream day for alumni" will be the theme of the 60th annual reunion of the Lowell Technological Institute Alumni Association Saturday, May 16, as alumni borrow a college tradition of going up-river to picnic grounds for an old-fashioned chicken barbecue.

Registration will take place in the Alumni Memorial Library from 9 to 10:30 am, followed by a business meeting at 10:30 and a directors' meeting at 11:30. A highlight of the business program will be the presentation of honorary memberships and honorary award scrolls.

Tyngsboro golf club will be the scene of the barbecue and sports program in the afternoon. The committee is being headed by Joseph G Duffy, Wamesit Processing Co, and Edward M Lynch Jr, The Derby Co, cochairmen.

International Conference on Women's Ready-to-Wear Industry

An International Conference on the women's ready-to-wear industry, organized by the International Rayon and Synthetic Fibres Committee, will take place in Dusseldorf, Germany on June 18th and 19th. Over 400 ready-to-wear manufacturers from European and overseas countries are expected to attend.

Specific technical problems and others pertaining to distribution and sales promotion which the ready-to-wear industry is facing will be largely discussed at the international level. Papers will be given by specialists from Germany, Great Britain, France, Italy, Netherlands and United States.

A fashion parade will take place in the evening of the first day, during which a selection of models of the German women's ready-to-wear and underwear industries will be shown.

Dusseldorf is the site of an important international ready-to-wear exhibition. For this reason it was chosen as the place for the Conference. Over 1.000 exhibitors will participate in the Fashion Week (IGEDO) in June, among them many foreign firms.

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100 Attend Ontario Section Symposium

One hundred members and guests of the Ontario Section of the Canadian Association of Textile Colourists and Chemists met April 4 at McMaster University, Hamilton, Ont, for a full afternoon symposium under the chairmanship of John Mansfield.

The members present at this meeting took part directly and indirectly in the discussions on the processing of Acrilan, Terylene, nylon and Orlon through the submission of written questions prior to the meeting. These were answered by Walter Stump of the Chemstrand Corp for Acrilan, A J Straw of Canadian Industries Limited for Terylene and Armand P Zinnato and Glen Woodside of DuPont Company of Canada Limited for nylon and Orlon.

D Cooper, chairman of the Education Committee for the Ontario Section has announced that, because of the success of the refresher course for dyers and finishers held in October and November of 1958, serious consideration is being given to organizing a similar course later this year. Further details will be announced when the program has been completed.

The executive committee is already at work organizing the program and arrangements for the Ontario Section's Silver Anniversary Annual Banquet, which will be held the first Saturday in February, 1960.

Advance Registration for Summer Textile Program at Clemson Encouraging

Advance registration for a five-course summer program in textiles at Clemson College has been encouraging, according to Dean Gaston Gage of the School of Textiles.

There is early evidence, he related, that the South Carolina industry is cognizant of an opportunity to assist the "large numbers of young men who choose textiles as careers without having attended a technological college." Many textile companies have employed exceptionally competent graduates in liberal arts colleges, who will benefit inestimably from a three-to-six week short course program, he stated.

Short courses will begin June 15 in yarn manufacturing; July 6 in fabric development and supervision development; July 15 in motion and time study; and July 27 in quality control. Each course will be presented as a full-time program, running for three weeks with no classes on Friday afternoon or Saturday mornings. No entrance examinations nor college credit will be given.

GPC to Teflon-Coat During Vacation Period

General Plastics Corp, Paterson, NJ, is making arrangements to concentrate on the coating of textile equipment during the industry-wide shutdown period.

The firm, which specializes in the Teflon coating of dry cans, slasher cylinders, thermopanels, J boxes, dye pans, idler rollers, valves and other equipment, suggests that reservations be made now so that coating or recoating can be done during the vacation period at a minimum of inconvenience.

• NEW PRODUCTS AND DEVELOPMENTS •

Silrama

Union Carbide's Silicones Division has announced the introduction of Silrama, a new process for dyeing glass cloth. Bringing a line of new and brilliant colors and deep shades to the fast-growing decorative glass fabric industry, Union Carbide's new process reportedly permits the use of fourteen different classes of dyes, and makes possible, in presently used Coronizing lines, the production of fabrics with a host of new colors. The new process promises to broaden design horizons in the decorative glass fiber field, it is stated.

Utilizing the affinity of the new organo-functional silicones for glass and the chemically reactive nature of the pendant groups of these chemical molecules, the Silrama process is said to be especially suitable for dyeing with pigments and vat colors.

Gagliardi Research Corporation of East Greenwich, RI, Union Carbide's consultant in this development for a considerable period of time, reports successful application of such water-soluble dyes as vats, vat esters, vat acids, acid wools, sulfurs, directs, naphthols, direct and developed dyes, premetallized acids and neutrals, and the new reactive dyes. Similar results have also been obtained with water-dispersible pigments of both the organic and inorganic types, it is claimed.

Heretofore, glass fabric dyeing has been limited to the use of selected pigments. Preliminary tests of new deep shades obtained with the Silrama process reportedly show marked improvement in alternate light and washfastness, and solvent resistance is an additional advantage. This new development is said to make possible a vastly expanded color line of glass fabrics maintaining fabric properties that meet the rigorous standards developed for the industry by Owens-Corning Fiberglas Corp and the glass fabric weavers.

The Silrama process was initially tested on production equipment by J P Stevens & Co. Inc at its Slater, SC, plant. Pilot runs and control tests have also been completed by Owens-Corning Fiberglas Corp at its Ashton, RI, laboratories. Introductory showings of glass fabrics of selected shades and colors made possible by the new process will be made this week by J P Stevens & Co, Inc.

The process is now available for licensing. Union Carbide's Silicones Division reports that it expects to see the major glass weavers ready for production by early fall of this year. Additional scale-up developments should make limited production possible by this time. J P Stevens, Carbide's first licensee, having assisted in the production scale-up of the new process, expects to start limited production during the coming summer.

D D Gagliardi (left), Gagliardi Research Corp, and M A Lynch Jr, Union Carbide's manager of the Silrama Process, examine Silrama-treated glass fabrics

Union Carbide reports that the possibilities suggested by the basic dyeing development should certainly spread throughout the glass fiber industry, and could have a real effect on the printing and dyeing of many additional fabrics. M A Lynch Jr, Union Carbide's manager of the Silrama process, stated "we have in this process a new and basic approach for attaching dyes and pigments to fabrics. It is our hope that early acceptance and success will prove a boon to the glass fiber industry and will, at the same time, provide us with real incentive to expand our development into other areas of promise."

John Wilson, merchandise manager, Decorative Fiber Glass Division, J P Stevens & Co, Inc, in outlining his company's plans for the introduction of Silrama-treated fabrics, expressed the opinion that this new approach to dyeing glass fabrics will greatly increase the sales potential of fiber glass curtains and draperies.

Pyrazol Fast Blue BGUL

Pyrazol Fast Blue BGUL, a new Sandoz direct blue dye, reportedly offers minimum shade change when aftertreated with resins, fixing agents or combinations of them. It is said to have unusually good fastness properties. It is being recommended by Sandoz for outstanding economy in full shades of blue on cotton and viscose.

Leaflet T-911a on Pyrazol Fast Blue BGUL is available from Sandoz District Offices.

De Paul Announces New Weighters

De Paul Chemical Co, 44-27 Purvis St, Long Island City, NY, has developed three new specialized weighters designed to add weight and enhance the hand of nylon and acetate tricots, yarns and piece goods.

Acetate Weighter is said to be the first weighter of its kind specifically developed for use on acetate tricots, yarns and piece goods. Delustering agents and softeners reportedly can be used in conjunction with Acetate Weighter for desired hand.

Nylon Weighter S is described as a unique compound specifically developed for adding weight to nylon tricot, yarns and piece goods.

Nylon Weighter G is said to give both weight and added hand to nylon tricot, yarns and piece goods.

De Paul states that all three weighters have been tested and proved in plant production and are being widely used in a number of large processing plants.

Samples and literature are available from De Paul on request.

Katherine Mills Using Mitin to Mothproof Wool Lines

Katherine Rug Mills, Inc, Dalton, Ga, is featuring the protection of permanent Mitin mothproofing on its 1959 lines of quality all-wool fabrics, according to John H Cox, director of sales.

This leading tufter was also the first of the tufted carpet manufacturers to mothproof its wool fabrics, Cox said.

According to the Katherine sales executive, the company is placing increased emphasis on its Mitin-treated all-wool tufted lines for 1959 as a result of the "enthusiastic reception" accorded its initial venture into quality all-wool products last year. Mr Cox credits Mitin, a permanent-type nontoxic mothproofer produced by the Geigy Chemical Corp, with playing a large part in the success of these all-wool lines.

Katherine's ad campaign for 1959 will capitalize on the value and "new-look-on-the-floor" aspect of tufted floor coverings, with a "Floorward Look" theme in its consumer ads.

As an integral part of its quality approach, all Katherine wool carpeting ads will also stress the permanent protection of Mitin mothproofing as a product feature, Mr Cox said.

• NAMES IN THE NEWS •

Platnick

Regent Machinery Corp has announced the election of **Leonard H Platnick** as president.

Regent Machinery Corp is a recently formed company for the importing of European textile finishing machinery to the United States, Canada and Mexico, and the exporting of textile machinery to Europe and South America.

Mr Platnick was formerly chief engineer, textile division of the Cosa Corp.

Shaw

Eugene R Shaw has joined Stein, Hall & Co, Inc as a burlap sales specialist in the company's Atlanta branch sales office. While his primary concern will be to call on the manufacturers of tufted carpets in Georgia and Tennessee, he will also sell the full line of Stein Hall's burlap products in that area. He will headquarter at Stein, Hall's branch office in Atlanta.

For outstanding contributions to the knowledge of color in science, art, and industry, **Ralph M Evans,** director, Color Technology Division, Eastman Kodak Co, Rochester, NY, became the second recipient of the Godlove Award of the Inter-Society Color Council.

The presentation of the award was made by **Walter C Granville,** president of the Inter-Society Color Council, at the banquet held during the 28th Annual Meeting of the Council in New York at the Statler Hilton Hotel April 1. The award is highly unusual in form, consisting of a plastic prism in which is embedded a gold diffraction grating, which produces all the colors of the spectrum. The words "Art, Science, and Industry" are engraved on the face of the award. In the center on one side appear the words "The Godlove Award for Contributions to the Knowledge of Color." On the other side appears the name of the recipient, the date of the award, and the name "Inter-Society Color Council."

Waldron Faulkner is chairman of the Godlove Award Committee, which includes **Walter C Granville** and **Deane B Judd.**

Mr Evans is an internationally known authority on color and color photography. He has made a number of important discoveries in both fields. He is a past president of the Inter-Society Color Council and at the present time secretary of the Council. He is active on the color committees of several other scientific societies.

Mr Evans is author of about twenty-five research publications and also of the book "An Introduction to Color." He also holds a number of patents in the fields of color and color photography. On behalf of the Committee, Mr Faulkner said that the naming of Mr Evans was unanimous.

Sprenger

Warwick Chemical Division, Sun Chemical Corp, has announced the appointment of **Gerhard E Sprenger** as research manager for the Division. This new post at Warwick's Wood River Junction, RI laboratory has been made necessary by the enlarged scope of the division's activities.

Dr Sprenger has been employed by American Cyanamid Co, General Aniline & Film Corp and Metro-Atlantic, Inc before joining the Warwick organization. He will be in charge of new product development and will report to Warwick's technical director, **H B Goldstein.**

K J Winter, assistant to **Harold Ackerman,** president of A D Juilliard & Co, Inc, as wool and yarn buyer and in the production department of the woolen and worsted division, has announced his intention to retire from the company in June.

Dr Winter, who has been associated with both the Cohama and Juilliard divisions of United Merchants & Manufacturers, Inc in an executive production capacity for over 18 years, will devote several months to travel in Europe with his family, and will announce his new business interests upon his return.

Mr Ackerman stated that no successor to Dr Winter will be appointed, but that his purchasing activities would now be handled by himself.

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